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NEWS IN BRIEF

Low Threshold
response

POOR response to advertisements for Threshold computer training courses in the Bristol area have caused NCC staff serious difficulty in getting courses organised. A newspaper campaign had to be repeated before the necessary 45 young people had applied so that a single course of 16 could be filled. The pass rate for the aptitude test is about one in three.

This is despite unemployment of 5,000 teenagers in Avon, but plenty of white-collar vacancies.

GA sues ex-boss

THE legal slugging match between General Automation and ousted president Larry Goshorn is hotting up. Following Goshorn's second suit against them alleging that he was barred from GA premises (CW, July 9), the directors are suing Goshorn, saying he wasted corporate assets on personal road and air travel.

DEC price cuts

PRICE cuts ranging between 11% and 60% have been announced by the Digital Equipment Corp for add-on MOS memory for PDP-11/34A, 11/70 and Vax-11/780 computers.

October Times?

STEADY progress has been made in talks at The Times with some print unions, allowing for staff cuts and a disputes procedure as asked for by the management, while other difficulties persist, such as what will happen to management members of the NGA who crossed picket lines. The Times wants a "no victimisation" agreement to apply on both sides. Staff remain optimistic that publication could restart on October 1.

ICL may be reported to Monopolies Commission

THE Office of Fair Trading is close to referring ICL to the Monopolies and Mergers Commission. The move follows complaints from several independent suppliers of used ICL computers and ICL-compatible equipment, about ICL's alleged monopolistic practices.

If the OFT goes ahead it will ask the Commission to look into the whole computer market rather than ICL specifically, because it is not allowed to refer one named company to the Commission.

Under definitions in the 1967 Fair Trading Act, a monopolistic situation can exist if one company holds at least one quarter of a particular market and prevents, distorts or

restricts competition in the supply of goods or services.

The OFT has been looking into the ICL case for some time (CW, June 23, 1977). Used ICL computer vendors, Reliance Computer Brokers and Computer Resale Brokers, have complained about ICL's refusal normally to maintain machines at second user sites if they are more than seven years old.

Systems Reliability Ltd and Teknos Management, which build add-on memory and plug compatible disc subsystems, respectively, for ICL machines, complained about the technical and pricing obstacles that ICL has constructed to discourage or prevent users from installing their kit. One

particular cause of discontent has been the 20% compensatory levy that ICL demands from users that install their kit, a policy which ICL has doggedly refused to change.

Teknos and Systems Reliability have also complained to the EEC Commission's Directorate of Restrictive Practices and Abuse of Dominant Positions about ICL policies (CW, September 21, 1978).

If ICL is found to be infringing articles 85 and 86 of the Treaty of Rome ICL could not only be forced to change its policies; it could also be fined up to 10% of its previous year's turnover — more than £500 million last year. ICL would have the right of appeal to the European Court of Justice.

Magnuson
in UK ahead
of schedule

THE IBM-compatible M80 series of mainframes built in the US by Magnuson Computer Systems is now being offered to the general IBM computer using community in the UK by Magnuson ATC, the independent agency set up late last year to sell Magnuson machines to the European air transport industry.

Magnuson ATC said that general marketing of M80s in the UK was originally intended to start in September, following the formation of a Magnuson subsidiary, Magnuson Ltd, but the level of interest in M80s was now so high that Magnuson ATC had decided to handle general sales itself.

Magnuson ATC is currently looking for a large software house with substantial IBM experience to provide Magnuson users with systems engineering support, and Data Logic is considered to be the most attractive proposition. Data Logic confirmed that negotiations with Magnuson ATC had started, but emphasised that any agreement that might be signed was at least one month away.

Data Logic has considerable

experience in IBM 370 project implementation through its professional services division, which has offices in London, Manchester and Birmingham.

Magnuson ATC is currently also evaluating third party maintenance companies, and says that it will probably sign agreements with two of them.

IBM seeks \$1,500m loan

UNDERLINING the difficulty of running even a company as strong and successful as IBM, second-quarter net profit fell 3.4% to \$667 million — and IBM is seeking to borrow up to \$1,500 million only a year after spending \$1,340 million buying its own shares.

After the 3030 series, which generated an embarrassingly higher level of orders than IBM anticipated, the company hoped to match supply to demand with the 4300s. But in the US, deliveries are spread over three years and in the UK, anyone ordering a 4331 this week would

CW gives £1,000 boost
to micro awareness

A PLAN to increase awareness of microprocessors among schoolchildren gained a £1,000 boost last week when the proceeds of the 1978 Computer Weekly Charity Ball were handed over to Dr Leslie Jackson, chairman of the British Computer Society's computer education group, by Computer Weekly's new editor, John Kavanagh.

The group, which has 33 branches and 2,400 members, including 400 overseas, exists to further the introduction of computer studies in secondary schools. It will use the CW donation to put together a portable, free-standing display to promote micro awareness. The display will be available to schools for open days, exhibitions, parent

evenings or to support a lecture.













The BCS feels that on a wider scale the CW award will be useful in identifying the type of display which can be built and the advantages of replicating it on a national scale. It could thus guide the Department of Industry in the spending of some of its funds for the Microprocessor Awareness Project.

The CW ball, now widely regarded as the computer industry's major social event, will be held this year on Friday, October 12, at London's Royal Lancaster Hotel. Tickets are £17. Further information and tickets can be obtained from CW's editorial director, Chris Hipwell, at Dorset House, Stamford Street, London SE1 9LU.

Ford order

MICROPROGRAMMABLE GA 18 series minis and micros worth £500,000 from General Automation are to run five process control and monitoring systems at a new Ford engine plant in Bridgend, Glamorgan. Ford has been using General Automation minis for engine monitoring at Dagenham.

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Downtime

by Chad

More matter with less art.....

IT isn't just the technical side of computing that baffles outsiders. Our business seems to have developed a politics all of its own that seems quite inappropriate to the mundane nature of the subject — at least in the view of Douglas Ginsburg, a lecturer at Harvard Law School.

Ginsburg has written to the Wall Street Journal pointing out the ironic juxtaposition of two stories, one about the value of art as an investment and the other about the frustration of IBM's lottery for 4300 machines (CW, July 12). He was puzzled that art should be bought and sold according to the principles of supply and demand while computers were not.

Why, asked Ginsburg, should there be a straightforward marketplace approach to art, which moves men's souls, and something else to allocate the computers that move their transactions? Why does not

IBM sell 4300s according to the price system, simply by letting the price rise until fewer people want them?

He goes on to ask, "Is it that IBM, and presumably other enterprises of its stature in the market, are now forced, by political realities, to act as profit maximisers? If so, why?"

Certainly the politics of IBM-baiting in the US I find totally mind-boggling, what with one group trying to force Big Blue to disclose its plans (to help the competition anticipate them) and another group trying to force IBM to keep everything secret (so as not to attract the other firms' customers).

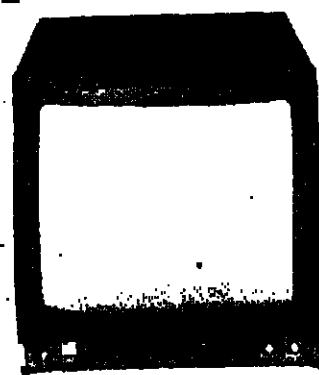
However, it is funny that it did not occur to Ginsburg that IBM is in fact maximising its profits long-term with the ballot, by hanging on to its customers. It seems that life is beginning to imitate art.

Look here upon this picture

IN the computer Press we have a continuing problem in trying to find interesting pictures to brighten up the paper. After all, one computer looks very much like another, and as time goes by their outside appearances seem to get more and more boring. The IBM 4300 looks like nothing so much as an electric storage heater.

We eschew printing endless photos of the same concrete and glass buildings taken from different angles. But nevertheless we are not helped in our efforts by many of the pictures that are sent to us. I think the one shown here wins the prize for the Most Boring Photograph of the Year so far. I would not be surprised if another one surpasses it before 1979 is out.

I suspect the photographer is a student of the recently-



fashionable school of Minimal Art — black squares on dark brown canvases and so forth. The less information there is in a picture, the better. Mind you, there are limits. A screenplay writer of my acquaintance once wrote a shot into a (black and white) film script: "Pan to a cloudless sky." On reading it over, he thought better of that one!

Coinage of a brain

HERE'S something to reflect on the next time you get worried about humans being taken over by machines. A friend who still braves the vegaries of London Transport (ecologically-minded Chad has just started coming to work on

a bicycle — smirk) reports seeing the following sign at St James's Park Underground station:

London Transport regrets that the automatic ticket machines are not working owing to staff shortage.

Expert systems pose a new sort of problem

By Robin Webster

Multi-role expert systems could revolutionise the teaching profession by providing a far more individualised service to the student. But the problems to surmount are great and the vast spectrum of human potentialities remains one of the greatest. To discuss the advances and remaining dilemmas a conference on expert systems was held at Edinburgh University earlier this month. ROBIN WEBSTER reports.



WHEN the noted mathematician Alan Turing pondered the controversial question "Can a machine think?" he discovered that it held too many ill-defined dimensions.

So instead of tackling it in the conventional style of his time, he raised the supplementary question: "Do we actually know what we mean when we use words like 'think' or 'intelligence', are we actually sure of our definitions?"

A similar inquiry can be made in terms of education by asking "Can a machine teach?"

Like the first question, the above needs refinement, and so we must see whether our understanding of what it is "to teach" is sufficient. In the absence of any undisputed theory of teaching it seems that we do not. And while various teaching models have been constructed and tested, it appears that we are a long way off from a generalised teaching computer.

Indications of where we stand with regard to progress in this area were to be found at Edinburgh University earlier this month, when the Society for Artificial Intelligence and Simulation of Behaviour held a conference on Expert Systems (CW, July 19).

An expert system, as described by Donald Michie of Edinburgh University, is essentially a "computing system which embodies organised knowledge concerning some specific area of human expertise... sufficient for it to be able to do duty as a skilful and cost-effective consultant."

It has three modes of operation. One is when it supplies a user or client with answers to problems; another is when the user enhances or increases the system's knowledge by acting as a tutor; and finally, when the expert system is used in teaching mode, making use of its accumulated data.

At the conference, Michie gave an example of how expert systems could provide more intuitive teaching in the future. It was found that when a particular chess end-game program was back-translated into readable English paragraphs it proved to be of more help to the amateur than a text written by a chess master.

"The reason for this appeared to be that the master tends to write for a player who already has some concept of the move he is being asked to do," explained Michie, "whereas the back-translation proved to be a good crib for the learner because it gave a more complete picture of the procedure."

One factor that must be introduced into future systems, added Michie, is that of a "human window" — so that the computer's inner workings can be considered.

Between the two extremes of a system which does a lot of computing and has a small amount of memory, and another which does little computing but has a large memory, Michie showed that there was a "window" where system operations become human-intelligible and human-executable.

He told the following anecdote as an example of why it would be necessary to have this.

Two chess masters were to pit their combined expertise against a solo computer program. They had a King and Queen while the computer controlled only a King and Rook. Play began and it was only a short way into the match when the computer did something very unexpected — it separated its Rook from the King; a move expert players

would deem incorrect and possibly fatal.

The psychological effect on the two human players was impressive. They played on vainly for another 30 minutes before deciding to retire from the game.

"Afterwards they were asked what they had felt when the computer made the unusual move," said Michie, "and they replied that it seemed counter-intuitive, hostile, almost alien and, in fact, downright suicidal."

In this case, the computer program used a viable but unconventional tactic to confuse its opponents; but transfer the sequence of events to an air traffic control centre, and the image is much more complex.

What would happen if an air traffic controller, for example, observed a computer taking a very unusual action? Should he override the move, or reason that the system was handling the situation in an outrageous but correct manner? Indeed, without Michie's "human window" would he actually be able to comprehend the logic employed by the computer before the point where an irreversible error was about to be made, and so make a competent attempt to correct it?

"We have to be careful of representations that are possibly dangerous and which are brought about purely by the demands of machine optimisation," cautioned Michie.

Commenting on the need for a human window, Tim O'Shea, a lecturer in education techniques at the Open University, said that it would be very elusive.

"It seems to me unlikely that we will attain such a factor for at least another couple of decades," he said. "Nor will we see generalised computer assisted instruction systems that soon. There will probably be many systems, each of use to a specialist group."

O'Shea classed computer scientists among those who

would benefit, but the thrust of what he outlined during the conference was the nature of human nature extremely difficult to assess.

"In developing a system to help students quadratic equations found this to be the most stumbling block," he said. "I indeed teach them the procedures involved, but as users were far too variable in their performance."

"Also, there was another factor in the situation. I programmed the system to access information from the students as they used it, so that I could learn more and more automatically. This did go to a 'look, no hands' menu, however, as I left it to the user to think of."

A successful system which discussed the power of a semantic grammar that it only deals with the power system trouble-shooter.

Developed at a research centre in Boston with US Navy funding it sets theoretical power systems, complete with special units, circuits that can be malfunctioned. The user is to trace and repair the intricate interactive queue.

"If the student is correct, inaccurate, Sophie for the reasoning behind the attempts," said O'Shea.

This is achieved by a program that interprets the student until it is said.

On the topic of question necessary for a computer, know if the particular correct one before it can be with that environment. An example of this is the robot system that is given task of picking up, say, a wooden block as opposed to red block that lies nearby.

Such steps are not taken the attempt has been made then this can lead to all sorts of trouble.

There is the tale of Stanford University which had a robot that had not been programmed with an awareness of its own structure and was about destroying itself in its room it occupied.

Or as Dr Pat Hayes of the University, reported in a conference, there was a humanoid robot that was programmed with the belief that there were copies of itself in other parts of the world.

Both Hayes and speaker John McCarthy of Stanford University were to overcome this "problem" and other machine logic.

COURSE

EUROMICRO, the European Association for microprocessing and microprogramming, is organising its sixth annual symposium, called Euromicro 80. This will be held in London, and workers in the field of microprocessing and microprogramming are expected to exchange ideas on the latest developments. The programme will consist of three sessions: scientific, industrial, and

International Federation of Information Providers mooted

VIEWDATA and videotex information providers should promote standards that lead to compatibility between systems, encourage the unrestricted flow of electronic information between countries and stimulate the growth of cheap, easy-to-use systems.

This was agreed by 13 interested parties who met in Zurich this month to propose an International Federation of Information Providers' Associations. They included three members of AVIP.

The Association of Viewdata Information Providers based in the UK, and members of equivalent organisations in Switzerland and Canada.

SVIPA, the Swiss Viewdata Information Providers' Association, was formed about four months ago by 40 firms that were interested in providing information for the pilot trial to be launched in October by the Swiss PTT. Participation in the trial is to be limited to 70 organisations, to suit the 16 port GEC 4070-based

system. Association members so far include publishers, a department store and a hotel group, as well as Swissair, Nestle and Reuters.

The Canadian group is tentatively called the National Association of Videotex Service Providers, and field trials will begin later this year.

The word "service" in the title reflects the intention that information will not be the only service provided over videotex. French and German delegates to the

Zurich meeting were urged to form national IP groups, so that the international body could consist entirely of federated national associations.

The organisation is to be registered in Switzerland, but its next meeting is planned for London in the autumn. It is hoped to attract further countries where videotex is being developed, and to provide for the exchange of information between members and copyright protection of the contents of databases.

Graphics giant set up by triple merger

A FORMIDABLE computer graphics manufacturer with a complete range of graphics products should be fully established by the end of the year following the acquisition of Calcomp by Sanders Associates (CW, May 17).

Apart from the highly sophisticated graphics display systems of Sanders, and the display and pen plotter products of Calcomp, the new enterprise will also be manufacturing and selling the electrostatic printer/plotters built at the moment by the instruments division of Gould Inc.

Calcomp has come to a definitive agreement with Gould to

acquire its electrostatic products, and the deal has the full approval of Sanders.

It should be completed very shortly and, by next year, the manufacture of the Gould products will have been moved from Cleveland, Ohio, to Anaheim, California, the location of Calcomp's headquarters.

The Calcomp acquisition is consistent with its policy of concentrating on its graphics products business following the sale of its OEM disc drive manufacturing operation to Xerox (CW, November 9, 1978).

Calcomp's sales of graphics products were worth about \$50 million in its 1978 fiscal year.

The turnover of Sanders Associates in 1978 was \$150 million, although a large proportion of this sum came from military electronics and radar equipment.

On the DP side, Sanders builds a system called the Graphic 7. It also developed the 3250 graphics system for IBM.

Since it sold its Data Systems division to Harris (CW, February 17, 1977) Sanders has had no marketing operation in Europe.

Calcomp in Europe cannot say when it will be selling the Sanders systems over here but it already knows the Gould electrostatic product line very well.



A SATISFIED Intel customer is Peter Merrick, managing director of the Lowndes-Alax data services organisation, the first UK firm to install an IBM compatible Intel 80386.

The 7031 has replaced an IBM 370/155 and works alongside the bureau's 370/155 Attached Processor system. The Intel machine is being used as the main processor for L-A's interactive teleprocessing services, which include financial planning and personnel information services. The 7031 runs under MVS with TSO, the financial planning package, Simplan, and the interactive database software, System 2000.

US-based micro software wholesaler plans UK launch

THE quality and variety of business software available in the UK for micros could get a fair-sized boost from next month when Lifeboat launches its UK operation. Set up two years ago in New York City by expatriate Englishman Tony Gold, Lifeboat acts as a marketing, support and distribution operation for soft-

ware to run under the CP/M floppy disc operating system on a wide variety of microcomputer systems.

UK director Mark Potts said that accounting packages had been produced for the UK market by a London micro software house called Graffcom.

But the bulk of the products

come from the US, from software houses such as Digital Research, which produced CP/M, and Microsoft which has produced 4K, 8K and disk extended versions of Basic — regarded as industry standards, and said to be installed in 200,000 machines.

Products from five or six main

suppliers are supplemented by material sent in unsolicited, which Lifeboat checks out and provides documentation for.

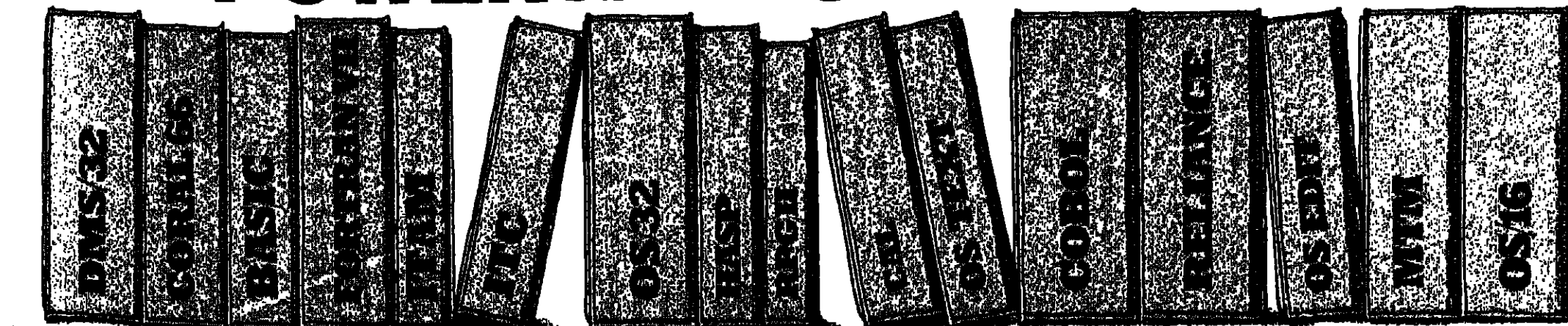
Prices start at £25 to £30 for simple text processing programs, although one or two editing routines sell separately for £8. In the middle range, a link loading Fortran compiler costs

£225, and at the top end applications packages go up to £400.

Software interfaces have been developed to enable all the operating systems, languages and applications to run on about 50 different machines.

Lifeboat's London office is expected to open late next month at 32 Neal Street, WC1.

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For Commercial Applications, there's the newly released REMANCE, a complete software system for implementing transaction processing on Perkin-Elmer 32-bit Superminis, comprising an Integrated Transaction Controller, a Data Management System, and COBOL.

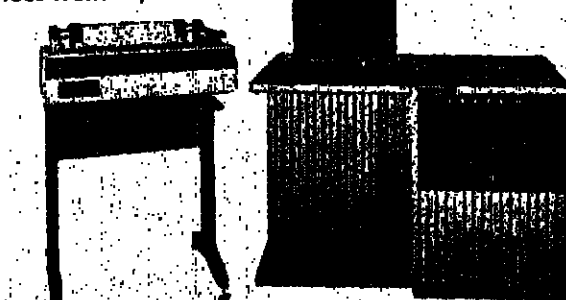
Major features are automatic transaction roll-back, automatic record locking and unlocking, system-wide recovery and re-start abilities and complete database integrity regardless of any problem.

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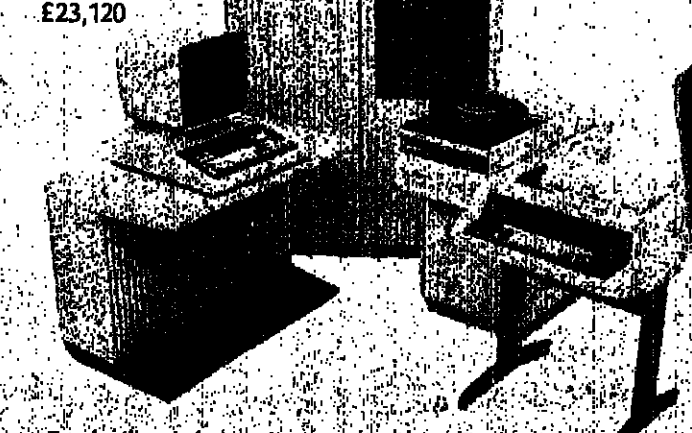


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GUEST PRIVATEVIEW

This Guest Privateview is by **RODERICK REES**, a systems support manager at ESAMS, where he heads a team working on

maintainability, reliability and safety for the air defence variant of the Tornado interceptor aircraft. Rees is especially interested in the

ways systems fail — even when they appear to be operating normally. This involves study of the man-machine interface.

New growth areas are too intellectual

OBSTACLES to "micro modernisation" of the UK have been cited by Michie's Privateview including the difficulty of tempting people from places where new technology has made them redundant to fresh places where other new technology has created job opportunities. The list of difficulties could be extended.

In many areas of the country, a surprising proportion of men live in their wives' home area — "she wanted to be near her mother".

Clydeside shipbuilders wouldn't allow a shipyard to be moved a few miles along the coast because they would not move house nor commute a few miles extra. And we all know about the "new town blues".

In other words, the preservation of a community feeling — sometimes, but not always, most strongly expressed matrilinearly — is of high value. But if unions agree standard wage rates for all working in areas, there is no economic draw into the community unless other economic factors happen to go the same way.

Programmers' and engineers' pay rates are largely subject to

supply and demand. Thus those who wish to work in relatively remote but pleasant areas, such as the West Country say, may accept lower rates than must be paid to attract people into London.

Tinkering with the working week or educational release will not change that. Mostly such things will, in any case, affect only those who do not suffer from unemployment anyway (how many Port of London dockers will want educational day-release?).

The whole situation is complicated by unpredictable and arbitrary matters of taste and fashion. Who could expect, for example, that the "microprocessor revolution" could, at so early a stage, seriously attempt for £139 to compete for the £1 pocket phrase-book market?

More than that, many of the traditional skill areas, particularly in engineering, included manual, holistic ways of thinking and operating that were valued by the workers.

The new growth areas like programming are too intellectual. Not many machine tool craftsmen, for example, will wish to, or be able to, convert to

a purely intellectual skill. What is more, I believe they are right. A community that is so heavily intellect-based must expect some sort of social or psychological problems from neglect of the non-intellectual capacities and failure to integrate them.

In the long run, I believe a community which is heavily intellect-based must, for its own health, deliberately seek to create growth areas which are based on non-intellectual activities or, better still, on thoroughly integrated areas.

This will be difficult. The enormous increase in the number of craft potteries indicates the abstract pattern that is required, but they do not bring in enough money.

In the end, people look for meaning, and human meaning cannot be intellectually expressed.

I did once meet a computer engineer who, answering my challenge, claimed that he could write a program of instructions for how to make love to your wife — if so, then anyone should be able to use it. But I don't think he asked his wife's opinion!

A part of the problem over technological unemployment is

people's bolshie reaction to having to work automatically; that is, being forced to behave like intellectual abstractions.

"Job enrichment" is a hesitant scratch at the surface. Encouraging the creation of small firms will help: the human interactions seem usually to be rewarding in themselves, no matter how dull or even unpleasant the tasks. In this sense indeed, "small is beautiful".

Perhaps a start which would be socially acceptable — its economic success could be more than guessed at — is the encouragement of small firms, started and owned by local people including union members, encouraged and funded if possible by unions. Meriden did it backwards.

First you must identify people in, say, the shipbuilding community in Glasgow, who given a little, and only a little, help have enough go and enough of the community's trust, to make a company succeed.

It is hard to see much else that can succeed, except allowing outsiders to come in, so that we become the world's employees.

If the Americans are frightened of the Japanese and Japanese are frightened of the Koreans, what will happen to UK micro-electronics firms when the Koreans really get going?

So we must do it ourselves, and that means we must first devise "it" for us to do.

SOFTWARE FILE-1

US to restrict sales of Datasecure to 'safe' installations

A CRYPTOGRAPHIC security system developed for ADR's database management system Datasecure/DB is being regarded by US State Department officials as too sensitive for uncontrolled marketing outside the US.

The system, Datasecure, was developed by ADR in conjunction with a company specialising in data encryption technology, Computation Planning Inc (Complan). It is scheduled for release in the US this year.

It looks unlikely, however, that the software will be marketed in Europe, as the State Department is reported to regard it as an instrument of war. It is therefore insisting that each installation be explicitly authorised.

Only the implementation is being protected, the algorithm it employs, DEA, having been published four years ago by the National Bureau of Standards as part of its data encryption standard.

DEA has been adopted by such systems as the Federal network for the protection of interbank funds transfer and been endorsed by the National Security Agency for application to classified material.

It has also passed the vote of the Anal section of the X3 as the first American National Standard on cryptography.

ADR Datasecure divides the use of encryption as "near absolute" protection of information on removable media. It also argues that the intelligently applied, cryptos less costly than older methods.

As well as making use of read access "economically unfeasible", cryptos protect files against tampering, change even a single bit causing the whole file to appear as noise.

All other Datasecure/DB Datasecure/DC products are in this country by CPM (Software File, June 28).

Control of user access a feature of Oscar

CENTRALISED logging and recovery, control over user access, and a means to monitor system utilisation are the chief facilities provided by a new systems software package for use on minicomputers supporting multiple VDUs.

Oscar, Online Security Control and Applications Routing, the software was developed by GMS Computing, of Sheffield, and has so far been supplied to Infocore 7000 users.

It is written in Cobol and could be implemented in most minicomputer environments.

The main aim of the system is to control terminal usage. This is achieved via a system of passwords, restricting named terminals and users to specific applications, transaction types and files.

In addition, the software provides a standard logging and recovery mechanism and facilities for recording and analysing transactions processed.

Oscar works by mediating program calls to the operating system, sitting between the application and the operating system.

As a result, it imposes a small overhead on most file handling operations, slightly degrading the response time. GMS argues that this penalty must be traded-off against increased security and points out that considerable tuning is possible.

given a suitable operating architecture.

A further consideration: significant savings in time recovery where the after a crash, was one of the previous night's.

Oscar is priced at £4,000, including installation and maintenance. On machine, it could cost more, depending on the features of the Cobol.

Components satisfying all three of these requirements now look likely to be available by the middle of next year, leaving just two further items on the original list outstanding.

The first of these is a compatible editor. Although the George 3 and VME/B editors are very

Pascal-like control structures allowed

AN APL preprocessor allows APL programming in Pascal-like control structures as well as other extensions. It has been produced by an APL software house, Codecast, Turin.

Called Aplomb, the preprocessor written in APL, expands its own notation to standard APL, which is handled by the existing interpreter.

Codecast says that the preprocessor makes labels and branches redundant by offering a more readable — control flow IF-THEN-ELSE, WHILE, FOR-UNTIL-DO, and so on.

The basic price of the preprocessor is \$5,000. It runs on the IBM 370/158 and PDP-11, requiring a minimum workspace of 200K bytes.

Library for LMR

THE Chemshare library, developed by Chemshare Process Systems, has been installed at London United Chemicals. It consists of a set of programs for process simulation, design, and optimisation, which will be used by the company's physical property

SOFTWARE FILE-2

Altergo language slashes TP development time

AN online programming language has been launched by Altergo Software which is claimed to slash the complexity of traditional TP application development and make possible substantial savings in development time.

Called CPG, Communications Program Generator, it also makes TP programs independent of their environment, so that the operating system, TP monitor, or file organisation can be changed without requiring changes in the application code.

Altergo is currently marketing versions which support either CICS or Shadow II, under both DOS and OS. It expects to announce an MTCS version shortly.

As a language, CPG is most closely related to RPG II, sharing some of its syntax and using a similar fixed format representation. It offers in addition a large number of extensions specifically designed for online programming.

These include for example an integral screen mapping facility and tools for screen manipulation and data editing.

A key aim of CPG is to simplify the programmer's task, eliminating the need for specialist knowledge and training. This is reflected in user programs by the absence of TP monitor linkages, IOCS macros, and record structures.

Instead, such items are held externally to the program in two libraries: the Central Routine

Library, which holds linkages and access macros, and the File Table Generator, which defines file structures.

Should there be changes in the system software environment, or in file organisation, only the library entities need to be modified and not the program code.

Programs compiled by CPG are re-entrant and multi-tasking and are said to be highly optimised and compact. As a result, claims Altergo, CPU and paging overheads are lower than with conventional languages and response times correspondingly improved.

Altergo obtained marketing rights to CPG from the West German software house Renker which

developed it and which will continue to carry ultimate technical responsibility.

Although the marketing agreement is worldwide, Renker has retained exclusive rights to the CICS version in West Germany, where it already has 80 users.

CPG costs £6,500 under DOS and £7,500 under OS.

CPG addresses much the same user requirements as ICL Datasat's Solve, currently under development for 2900s running under VME-B (CW, March 2, 1978). Solve, now renamed by the company as Slave and likely to be launched early next year, differs however from CPG in being interpretative and using an English-like syntax.

Univac version of Quikjob

WESTINGHOUSE is to market a Univac version of the highly-regarded report generator and general utility Quikjob, previously available only on IBM equipment. It will run under the VM/QS or VS/9 operating system on Univac Series 70 or Series 90 machines.

The new version was produced by System Support Software, the US developer of the original Quikjob package, and costs much the same as the IBM implementation. A permanent licence for Quikjob II costs £2,200 and, for Quikjob III, £3,750. An implementation of Quikwrite, which includes Quikjob III as a subset, will also be available.

IBM-oriented system software is only rarely converted for use on other mainframes, though the much larger Mark IV system is also available on Univac systems in addition to IBM and Siemens. The Univac Series 90 has also attracted the attention of the NCC, which last month launched a version of Filetab for it (Software File, June 21).

The DP manager who wrote the lease on his 303X and then paid the price

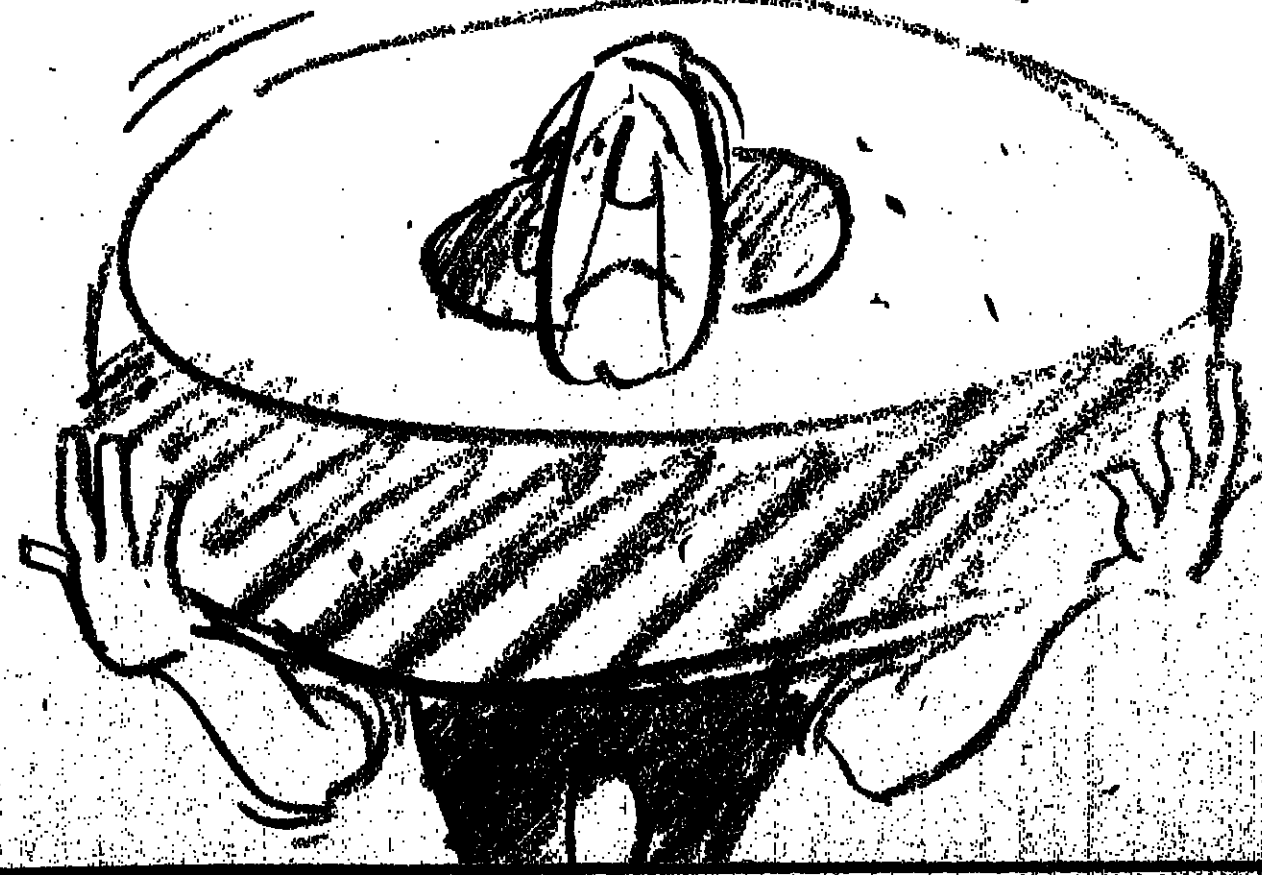
He thought he was doing his company a favour. Take the 303X on a financial lease, write it off over the leasing period, and then remarket it himself at the residual value. Pretty smart.

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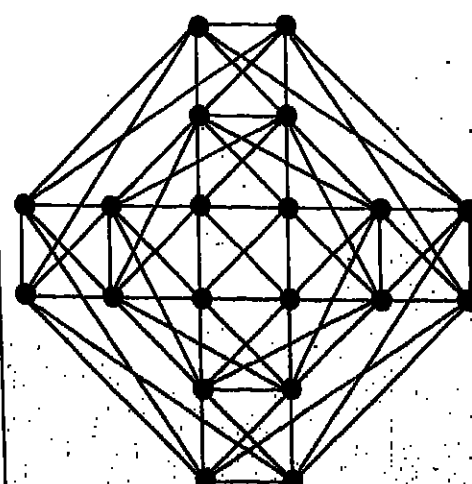
SOUTHAMPTON has been chosen as the venue for the First International Conference and Exhibition on Engineering Software, to be held from September 4 to 6.

Major engineering application fields to be covered include civil and structural, mechanical, environmental, transportation, electrical and electronic, and water resource engineering.

The concurrent exhibition will cover software products, services and equipment related to engineering software.

Further information is available from Dr. R. A. Adey, ENGSOFT, 125 High Street, Southampton, SO1 0AA. Tel: 0703 21397.

Puzzler



THE diagram on the left shows how 20 points, arranged in the shape of a cross, "generate" 21 four-point squares of various sizes. This week's problem is to remove six of the points, in such a way as to "kill" all 21 squares by taking away at least one of the corners in each case. See page 53 for solution.

OP SPOT

'This industry does not need trade unions'

OPERATIONS staff and union involvement is an issue on which John O'Reilly has strong feelings.

Chief operator at Astral Computer Services' London bureau, he first gave us a taste of his views some time ago (Op Spot, May 24).

On that occasion he said, in effect, that if an operator is dissatisfied with his site, there is no need to look to unions for help — he merely has to find another installation.

For those comments he received a sharp rebuke from a number of union officials who said that his advice amounted to advocating "job-hopping" (Op Spot, June 14).

Stung into action by that criticism, O'Reilly writes to Op Spot once again, pointing out that sites in the computer industry are crying out for staff.

The economics of the situation puts the employee in a very strong position.

"I am not for one minute suggesting that 'job-hopping' is the solution to every problem. However, the freedom to move about is something which very few industries have to offer, and staff should take advantage of it to better themselves."

In his view, the fact that staff move about is beneficial not only to the individual but also to the industry as a whole.

"We have the opportunity to better ourselves from an educational and financial standpoint, not only by taking but by contributing positively to the development of other sites by passing on the knowledge we have gained."

He argues that individuals should earn what they are

worth, and is critical of union bargaining.

"I am sure a lot of people would love all rises to be 7%, or whatever, across the board. It would probably be negotiated by a shop steward or two who could not distinguish between someone who was learning and contributing to the site, from another who was asleep all day."

He defends management by emphasising that he has always been well treated by them: "Since I have been in the DP industry, I have always worked for companies which interview staff regularly to ensure that they are content and are progressing along the right lines. Some of them negotiate pay rises on an individual basis — if that's not an incentive, what is?"

He concedes that unions are necessary and have their uses, but is adamant that the com-

puter industry does not need them.

"Let me state categorically that I realise under certain circumstances trade unions do a lot of good. However, this industry has a very good record for peace and so let's keep it that way."

Auerbach report highlights need for software monitors

SYSTEMS are becoming more and more sophisticated with the emphasis shifting away from batch work and towards transaction-based applications. As a result of this, job accuracy, information and observation by the operator is no longer adequate for assessing system performance. Software monitors are necessary, according to a portfolio by Auerbach Publishers Inc.

Called Analysing the output of the software monitor, it is one of the July updates to the Centre Operations Management, and relates to the merits of software monitors.

How one site kept cost of listing paper down

THE price of listing paper has risen by 20% in Belgium, but one site at least has found a way of keeping costs down.

Staff at Dow Corning, silicon product manufacturers in Brussels, have added a pseudo-writer to their IBM 3031, which runs under the OS/VS1 operating system.

And operations manager Gerald Boggiano reckons that the pseudo-writer, or WRTZ as it is often called, will save the com-

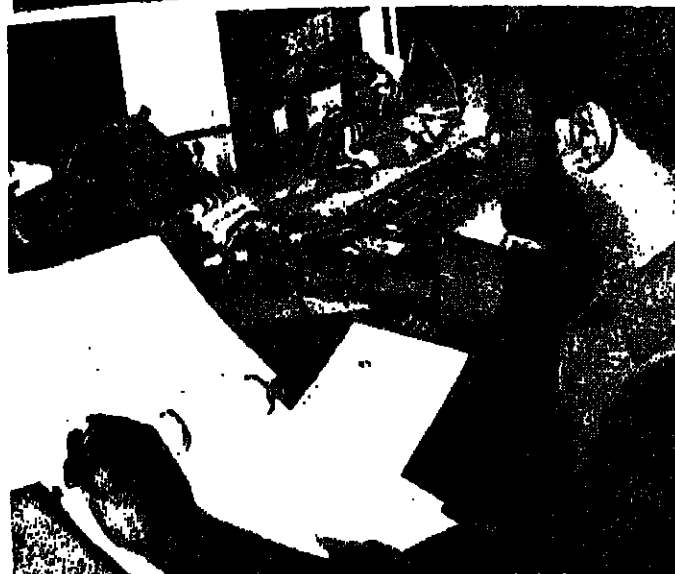
pany some 600 listing pages per week.

He said: "We have RJE links to terminals in five European countries and each of them may start and stop the readers perhaps three times a day."

"Before we put the pseudo-writer in, the readers would produce a listing with a header and trailer label each time they were stopped."

By Bernard Allen

MICRO NEWS



At an ICS troubleshooting course, a student becomes familiar with an in-circuit emulator.

ICS teams with Poly for courses that give hands-on experience

AFTER five years of persistent "door-to-door" selling of its microprocessor training courses by mail shot, Integrated Computer Systems has gained a roof over its head by teaming up with the Polytechnic of Central London.

Professor Derek Wilson of PCL explained that the college had responded to the last government's initiative to provide continuous education in microprocessors, and had picked ICS as a partner because it was established in the short course business, was good at marketing and had shown good administrative ability.

He added that he thought any US firm would have to stay up to date with its material if it was to maintain its financial viability in the fast-changing US market.

The courses will be one to five days long, and will start in September in the building in Holborn which was vacated by the School of Law when it found larger premises for itself.

A feature of the courses is that they provide hands-on experience of microprocessor devices, which, ICS president Dr David Collins explained, gives a practical understanding of what is involved and overcomes student fear.

On one of the general micro courses, each student uses his own Intel 8085-based processor board with a hex keyboard and two kilobytes of RAM, and also an interface board with a counter-timer, interrupt logic, analogue to digital conversion and several serial and parallel input-output ports.

On the troubleshooting course, four or five students

share test equipment which includes a logic analyser, an in-circuit emulator and logic current probes.

The aim is to train engineers to use micros in designing products that will be competitive, and to close the "implementation gap" between high technology in research establishments and the shop floor.

David Elise of the NCC said PCL and ICS were in at the beginning of a very large expansion in training for industrial students, with 11,000 more places expected in the UK as a whole in the next academic year. Training for maintenance and installation engineers was also important, he said.

The ICS scheme will add 1,000 places next year to the microprocessor applications and awareness courses PCL is already running. The £80,000 of government funds will enable it to re-equip the Holborn building to set up the scheme, which is expected to become self-financing very quickly, turning over about £½ million a year. It will be a base for single-client courses, modified to suit a particular industry, like those ICS ran recently for the National Coal Board.

Seven courses are planned initially, including a manager-level overview of microprocessors, telecommunications applications, manufacturing and industrial control and military systems.

Micros are the basis of about a third of ICS courses, and others have been developed recently in fibre optics, radar, digital image processing and signal processing.

Touch-sensitive keyboard

A TOUCH-SENSITIVE keyboard made by Star Devices of Newbury, Berks uses an unusual method of generating the 128-character ASCII set: it has 128

keys, one for each code; upper and lower case and control characters are all separate; and there is no shift key.

The price is £37.50, and the range of options from £2 to £8 includes various serial interface arrangements as well as the earphone and socket.

Thermal printer for Trendcom

PERSONAL Computers, the London-based Apple distributor, has started importing the Trendcom 40 chips thermal printer from the US and has sold the first 100 units to Apple and Pet users.

Selling at £243, the Trendcom 100 printer uses a five by seven matrix and prints bidirectionally 40 characters to a four-inch line.

10 years old

CHIP maker Mostek, which first produced the Z80 for Zilog before Zilog was able to produce it itself, celebrated its tenth birthday last month.

Set up in June 1969 to produce MOS/LSI, it shipped its first product the following year and has since grown to turn over \$134 million last year. It has 5,800 employees worldwide, offices in seven European countries as well as in Japan, and a manufacturing plant in Malaysia.

'First home computer'

"THE world's first true home computer" is the claim Ohio Scientific has made for its C8P DF, launched at the Chicago Consumer Electronics Show.

The claim is based on the number of add-ons and interfaces provided for entertainment and external control by the \$2,600 system. They include a real time clock for use in monitoring and controlling home devices while the system is in use as a personal computer, an AC interface for remote control of appliances plugged into

NCC seeks data on micro software

A SURVEY of microprocessor software is to be carried out by the National Computing Centre, in response to the large number of inquiries the centre has been

receiving on this subject. There will be two parts, one covering high-level languages and the other applications packages, and the NCC is keen to receive information on these from both suppliers and users.

Questionnaires are being sent to 800 software suppliers to determine what products and support services they currently have available. Any supplier who has been overlooked, and any user wishing to contribute comments, should contact Lyndon Morgan at the NCC, Oxford Road, Manchester M1 7ED, telephone 061-228 6333.

The information being collected on programming languages includes their characteristics, the versions available, their suitability for different applications, and how they are being marketed. The support provided by suppliers for applications

packages will be looked into in particular depth. The results of the surveys will be published.

The NCC has just published a paperback book by its Chief Editor of Publications, G. L. Simons, entitled Introducing Microprocessors. This gives a brief description of the principles behind micros, and goes on to list the specifications of most of the chips now on the market, and the software available for them.

Another chapter discusses what designers need to consider when incorporating micros into their products, mainly from the hardware point of view. The last two chapters describe a range of applications for micros, and touch briefly on the "social impact" side. There is an extensive bibliography the book costs £8.50.

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HINT OF THE WEEK

Deleting unwanted output

DELETING unwanted output in the Univac OS 1100 environment is the subject of a hint from Alan Winter, an operator at BP Oil, Harnall Hempstead.

Winter points out that certain file deletion jobs produce listings which are seldom read by anyone. This wastes both the operators' time and the company's money.

To avoid this, OS 1100 operators should make use of the delete option of the @SYM statement — a statement often used ordinarily to route listings to remote users.

He explains: "By placing @SYM, D PRINT as the last statement in the job, unwanted output is deleted by the system. As it is the last card in the run-stream, the statement will be

ignored in the event of an error statement and a dump will not be produced by the system. This might be needed for debugging.

He also has a warning which listings are needed by operators on some occasions but not on others: "The routine which writes the @SYM, D PRINT statement to delete the job will delete the job if it is not needed by anyone."

He writes: "The routine which writes the @SYM, D PRINT statement to delete the job will delete the job if it is not needed by anyone."

This statement will delete the job if it is not needed by anyone. As it is the last card in the run-stream, the statement will be

Spin-offs should justify space research effort

By Peter Percival

THE National Aeronautics and Space Administration is not exactly America's most popular agency these days. There is a persistent feeling, in Congress and in public, that it is an expensive ivory tower — a feeling strongly exacerbated by the long-running Skylab saga.

The agency has not helped itself by making defensive statements of a crass insensitivity. British radio listeners were told, for instance, that a political decision had been made between the chance of a catastrophe on Earth and the potential benefits of the Skylab experiments. No doubt true, but smacking of cynicism. Asked whether the experiments had in fact justified the risk, the NASA spokesman seemed less sure.

And it cannot have been very comforting to anyone living under Skylab's path to have been assured by NASA that the one in 150 chance of anyone's being hit by a piece of Skylab meant that 150 Skylabs would have to fall before anyone was hit. Even a child would find something to worry about in that piece of aeronautic deduction.

However, even accepting that NASA is periodically its own worst enemy, I contend not only that it would be a great shame if the Skylab affair led to renewed attempts to limit the space programme, but also that computer

people have a bigger stake than most in ensuring that the programme be allowed to continue.

After the US military, the space programme must have been the biggest single formative influence on both the architecture of large computer systems and the software development for the processing of large volumes of data. The benefits for minicomputer users are less easily discerned, but are certainly still considerable. Successful computer products and services companies have flourished on the back of the space programme.

Europe, in my opinion, has suffered from its relative lack of involvement in space since the 1950s. From my own experience of working on the Blue Streak project, I can cite a whole string of spin-offs, not least of which was the creation of SE Laboratories. The European Space Agency's 2880s may have been a giant headache for ICL over the last few years, but the company has gained inestimable software experience from developing the VME/ESA operating system — experience which will filter down to commercial users in due course.

It seems to me that space projects due to take place in the relatively near future hold a potential for the development of the computer industry that will make past spin-offs look like

chicken-feed.

If Skylab's return does provoke a general hostility to space exploration, that will be dreadfully ironic. For Skylab, far from ushering in a new era of large debris dropping from the sky, should in fact be an isolated occurrence. There are about 4,500 man-made objects, mainly satellites and parts of rockets, orbiting the Earth and fragments from re-entries reach our planet every day.

Skylab was only different because it was very much larger than anything else hoisted into near space — 85 tons of it, of which some 25 tons was not burned up on re-entry and fell to the ground at up to 300 feet per second. But Skylab came right at the end of the "non-returnable" era of space exploration.

Today we are in the age of the space shuttle which can go into space and return from it in a controlled manner and repeat the process many times. Not only will the shuttle not itself — God willing — descend to earth in Skylab fashion; it can be used to ensure that no other piece of space hardware does so in the future.

That is only a subsidiary attraction of the space shuttle, of course. For computer people the real importance of the shuttle era lies in what has been called the "industrialisation of space."

It has become an article of faith with the embattled NASA that the shuttle, so far from being simply a space experiment, is the key to the useful and even profitable exploration of space. Though cold water has lately been poured on some of its more optimistic claims, the agency could be right. And the computer industry stands to gain more if it is than most.

NASA says that the industrialisation of space can be divided into three groups: new products, new services and new sources of energy. Though we are all concerned with the third, it is to the first two that the computer industry should primarily turn its attention.

The use of space as a factory has several very specific advantages. The first of these is the near-absence of gravity. When the astronauts aboard the shuttle are not moving around in their suction-cup boots, or firing small rockets to correct the craft's course, gravity will be as low as one-millionth that of Earth.

In such low-gravity conditions (and even when activity is high aboard the shuttle, gravity will only rise to one thousandth of Earth's) containers are not needed to hold solids or liquids. This is an important factor in the manufacture of things which require a high level of purity — semiconductors, for instance, or optically perfect glass for use in lasers, or fibre optics.

More importantly, gravity induces convection currents which themselves lead to undesirable structural differences within solid materials. It is partly because of convection that the distribution of dopants in crystal growth is hard to control.

On Earth the distribution becomes uneven and the yield of usable chips from a semicon-

ductor crystal is consequently low.

In space, no such problems exist. Large, perfect crystals can be grown in near-zero gravity with constant electrical properties along their full length. This is not conjecture — it has been done. On the revived Skylab, Professor Harry Gatos of MIT grew a remarkably uniform indium-antimonide crystal and on the Apollo-Soyuz mission he repeated the feat with a germanium crystal.

Crystal culture in space will resume in 1981 on the shuttle. The Gatos space crystals were grown, as detractors hastily pointed out, by directional solidification in a closed tube — not a commercial process. Nevertheless the prognosis for space crystal culture seems good. The yield per crystal should be high enough to justify the cost of processing in space, and the extra quality should lead to new applications. Space crystals, for instance, should yield individual integrated circuits of a size which at the moment it seems impossible to achieve on Earth.

Crystal production looks like being one of the first space manufacturing projects that will be proven, or otherwise. It appears to lend itself to automation, which is important not only because production can continue on an orbiting module while the shuttle itself is absent, but also because the intervention of astronauts, would diminish the low gravity on which the process depends.

It is thought that perfect, flawless glass and optical crystals can be produced in space, again under full automation. The implications of this for the terrestrial communications industry could be enormous, and these materials could also provide a leap forward in memory and display technology.

On the services side, we have barely started to use space as a communications medium. The

In the wake of Skylab's controversial return to earth, it is worth re-asserting the case for further space research and its possible benefits. These are particularly likely to be of importance in the field of computing, according to Peter Percival, managing director of Magnuson Air Traffic Computers. In this article he draws on his experience as an early member of the British Interplanetary Society, as one of the team involved in the British Space Programme, and as a former assistant to Walther Riedl, who was deputy to Werner von Braun, the German rocket engineer who played such an important role in the development of the US space commitment.



The announcement by IBM of the 4300 series early this year shook the whole computer industry, in particular the growing band of software compatible machine manufacturers, SCMMs. They seemed highly vulnerable after the 4300 launch even though they were largely responsible for forcing IBM to make the giant leap forward in price/performance that the 4300 represented.

One SCMM that reacted to the announcement in a decidedly unruffled way was Magnuson Computer Systems, the firm that developed its M80 family of medium

scale IBM compatible machines from nothing in less than two years.

Magnuson sees itself in a safer position than other firms trying to compete directly with the 4300. It builds its own machines using low cost standard logic components. This gives it close control over its production costs and the modular design of its computers, described by Magnuson as "strategic architecture", enables them to be field upgraded with ease over a wide performance range and to be modified quickly to conform with any major design change by IBM.

Magnuson's response to the 4341 launch was to announce three new M80 models, two of which, the M80/42 and M80/43, will outperform the 4341.

Magnuson's marketing strategy is to offer a customer one of its earlier less powerful models with more or less immediate delivery while promising that it can be field upgraded to a 42 or 43 next year shortly after deliveries of the 4341 start.

Magnuson's reason for not shipping the 42 and 43 now is that it wants to ensure that they are 100% hardware and software

compatible with the 4341.

On a visit to Magnuson's headquarters at Santa Clara, California, Keith Jones of Computer Weekly talked to two of the company's key men. One was Joseph Hitt, president of Magnuson and the man most involved in establishing a European marketing operation. The other was Carl Amdahl, executive vice-president technology, who designed the M80 and who believes that his design philosophy will enable Magnuson to take full advantage of VLSI — very large scale integration.

Compatibles ready to hit back at IBM

By Keith Jones

MARKETING of Magnuson computers to the general IBM computer using community in the UK is now getting under way and should be in full swing later in the year after Magnuson Ltd is set up (CW, July 19). Till then potential customers will be taken care of by Magnuson ATC, the independent agency that was established late last year with the aim of selling Magnuson machines to the air transport industry in Europe (CW, November 9, 1978).

Asked about Magnuson's plans for the rest of Europe, potentially a far bigger market than the UK alone, Joe Hitt gave the firm undertaking. "Marketing of Magnuson computers will start within the next six months."

Listing the alternative marketing avenues being considered, he said, "We may establish our own subsidiary companies, we may use software houses or we could make an agreement with a big company like I.T.T." He was even considering the possibility of making a deal with

one of the European mainframe vendors like CII-HB.

Asked how Magnuson viewed the European market, Hitt commented, "We think Europe will be very good for us because there are lots more small IBM systems than in the US."

Working capital to finance expansion of the company's marketing and manufacturing operations appears to be readily available, judging from its June announcement that it had closed its second round of venture capital funding in an oversubscribed position, having received capital offers of about \$10 million — twice as much as it had sought.

Magnuson sees this achievement as something of a "test case" for the ability of the IBM compatible computer industry to attract new venture capital in the face of IBM's increased competitiveness in the form of the new low cost 4300 series.

Hitt freely admitted that IBM's prices were the biggest threat to plug compatible computer manufacturers.

The new working capital came from a number of sources, including Fairchild Camera and Instrument Corp, which already holds a large minority share in the company.

Hitt stressed that this equity funding was completely separate from the funding programme completed earlier this year involving several financial institutions, which enables Magnuson now to offer its customers leases ranging from one to seven years.

Hitt pointed out that although the finance has come from third parties, Magnuson itself will write the leases. Special features of the lease deals that Magnuson can offer include purchase options with purchase credits that can be accrued at up to 50% of the monthly lease rate and the option of converting a short-term operating lease to a long-term finance lease without penalty. Hitt believes that the latter feature is unique in the end user market.

Magnuson already has sales offices in eight major US cities



Magnuson Computer Systems' headquarters at Santa Clara.

but Joe Hitt is not prepared yet to say how many systems have been sold or installed, although one well known name in the DP business he quoted was the giant service bureau, ADP, which installed an M80 Model 4 last November.

Magnuson's biggest advantage over IBM is that it can deliver a machine within 60 days that can be upgraded next year to a system that can outperform a 4341.

Hitt claimed Magnuson's biggest advantage over some of its competitors in the plug com-

patible industry was that it designs, builds and sells its own machines.

Hitt asserted: "This makes our design more flexible and enables us to control our design changes. If Intel wants to make a design change it has to negotiate it with the manufacturer, National Semiconductor. We also have more control over our own costs."

Asked if the close family ties between Magnuson and Amdahl Corp could lead to an intimate commercial relationship, Hitt commented: "We have a good relationship with Amdahl, but we are not interested in being taken over by them. A year ago, maybe, but not now."

The product lines of Amdahl and Magnuson complement each other neatly, and Hitt does not see the two companies competing.

Looking at Amdahl, Magnuson and the burgeoning plug compatible peripheral manufacturer, Storage Technology, Hitt commented: "If those three firms merged it would be quite interesting."

Later Magnuson would move to ECL/LSI, the technology used already in the large scale mainframes built by Amdahl Corp, the firm founded by Carl's celebrated father.

Asked when Magnuson would start using 64K bit RAM chips in its memories instead of the existing 16K, Amdahl commented: "It is an economic consideration rather than technical. Some 64K parts will be available later this year and we will use them when they are cheaper than 16K."

In its announcement of the new M80 models earlier this year Magnuson stated that additional memory above the basic two Megabytes would be available in increments of two Megabytes at a price in the US of \$15,000 per Megabyte, as cheap as the memory that IBM will supply with the 4300 machines.

HITT: "We think Europe will be good for us because there are lots more small IBM systems than in the US."

'Bus structure will keep us up with the leaders'

"THE bus structure of our machines means that IBM 3032 class systems and beyond are realisable."

This was the confident assertion of Carl Amdahl, explaining why he believed that the minicomputer type bus structure approach he adopted in designing the M80 should keep Magnuson up with the leaders in computer technology.

Amdahl pointed out: "Machines with VLSI components will go faster with a bus structure because the distances between the devices will be shorter."

"The bus structure will make it easy to replace printed circuit boards with VLSI components arranged one behind each other like slides in a slide tray and linked together by the bus connections."

"This arrangement will minimise the distances between components and make it easier to interchange components and expand the system."

The microcode in each Magnuson computer in future will be generated automatically by software that will select re-entrant subroutines from the operating system and translate them into microcode.

According to Carl Amdahl, this is the way that Magnuson will "leapfrog" IBM in the area of microcode and deal with a threat that some industry observers believe is the means by which IBM will deal the knock-out blow to the SCMMs.

Amdahl sees the automated generation of microcode being extended even to highly used sections of applications programs.

This custom generation of large chunks of microcode for each system would be feasible on Magnuson computers because the two existing models, the M80/3 and M80/4, already have the capacity for 256K bytes of firmware, which could be increased.

"It is important to point out that the M80 is not a conventional bus-structured machine, but consists of a hierarchy of buses. The CPU, for example, is modular with its own bus structure."

Amdahl poured cold water on the suggestion that Magnuson might adopt the bit slice approach favoured these days by a whole string of minicomputer companies and now even by mainframe

manufacturers, the first being Univac with its 1100/80.

"With a bit slice architecture the width of the data paths can be changed but the functions are fixed. What we at Magnuson want is a function slice architecture where functions can be added."

At the moment Magnuson uses standard Schottky TTL MSI logic circuits from suppliers like Texas Instruments, Motor-

ola and Fairchild, but Amdahl revealed that emitter coupled logic would be employed in future models with Motorola and Fairchild as the suppliers.

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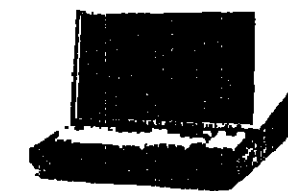
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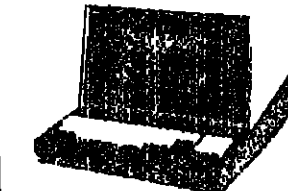
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- ★ Selectable Half or Full Duplex
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- ★ Green Phosphor Non-glare Screen



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PEOPLE AND EVENTS

Top jobs at Nexos and Motorola

APPOINTED to lead a team of microprocessor specialists and to support an OEM sales team for Motorola UK, is Ian Powers, who has been promoted to the newly-created position of marketing manager of MPU products for the company.

Powers was previously senior MPU applications engineer for Motorola, and his previous ex-

perience includes work on telecommunications and the design of software and hardware systems, mainly with Plessey.

Nexos, the office systems subsidiary of the National Enterprise Board, has appointed Joe Wilkinson to the board of Nexos Office Systems as financial director. He was formerly financial director of Eurotherm International, where he will remain on the board for the time being.

Chris Steggles, who introduced and developed the Arbat banking system, has been promoted to the new position of senior marketing consultant for the company with overall responsibility for product marketing. He is one of the longest serving members of Arbat, having been with the company for nearly seven years.

Derek Beasley has been appointed head of personnel and administration of Data Logic. For the past year he has been senior industrial tutor in the business studies department at the Polytechnic of Central London, and prior to this was head of personnel for British Olivetti.

Keith Brook has joined the PCA Data Processing Accessories as product manager for the new PCA-Minicare service. He was previously marketing services manager at Philips electrical equipment division and before that was general manager with Pyral.

Tim Lilley, Ken Harvey, David Lines and Rod Pugh have all been appointed by Atkins Online as sales executives, joining the Southern region force. Lilley was formerly departmental head with the Help the Aged charity. Harvey joins the company from an M.Sc course in management science at Heriot Watt university. Lines was previously regional engineer for Europe, the Middle East and Africa with Elliott Turbomachinery, and Pugh was an internal auditor with the Department of Energy.

David Ensor, until recently a consultant for Nexos Office Systems, a subsidiary of the NEB, has joined Data Recall as marketing director. In this position he will be one of four executive directors of the board. Before joining Nexos, he was general manager with Wordplex Europe.

Ramesh Sethi, internal audit manager with Forward Trust, a subsidiary of the Midland Bank, has been elected chairman of the Institute of Management Services, Birmingham branch.

Victor Jeffs has been appointed DP manager of Cornhill Insurance, based at the group's Guildford head office. He was formerly employed by the Lowndes Lambert group.



Thomas

Powers

Fairchild appointment

A FORMER general manager of IIT semiconductors, Dr Gerald Thomas, has been appointed divisional vice-president for Europe with Fairchild's semiconductor products group. Thomas will be responsible for the company's semiconductor operations throughout Britain and Europe, based at Fairchild's European headquarters in Finchley.

He joined IIT as technical director when its semiconductor worldwide group was formed in 1965, and was then promoted to director of operations for the company. Thomas has also worked for Standard Telephones and Cables.

The White Monk



The town crier of Hastings, Ray Goode, is seen here on an unusual assignment — launching The White Monk, an umbrella processing, instant printing and automatic typesetting service. Pictured with the crier are Tony White (left) and Michael Monk, partners in the business, which has allied mail house facilities from production to final mailing. The bulk of The White Monk's work load is expected to be word processing with an emphasis on automatic letter writing.

John Farmer has been appointed managing director of Magnetic Components. He has been with the company for the past six years and a director since 1974. He was appointed marketing director with additional responsibility for new product engineering in 1977.

Clifford Harley has been promoted to computer manager for the Leicester Building Society. He joined the society in 1963 in the investment department at the Oadby headquarters. He

succeeds Paul Rylett, who has retired after 42 years with the Society.

DIARY

AUGUST 6-8
Pattern recognition and image processing, IEE Computer Society, Chicago, Illinois. Contact: Pattern recognition, PO Box 639, Silver Spring, MD 20901.

AUGUST 10-22
Third Rocky Mountain Symposium on microcomputers, IEE Computer Society, Platteau Park, Colorado. Contact: Michael Tindall, Dept of Computer Science, Colorado State University, Fort Collins, CO 80523.

SEPTEMBER 4-7
Compton Fall 79, IEEE Computer Society, Capital Hilton Hotel, Washington, DC. Contact: Compton Fall 79, PO Box 639, Silver Spring, MD 20901.

SEPTEMBER 6
The future of real time languages in process control, ICS Process Control specialist group, Reading University, Reading, 10.00.

SEPTEMBER 11-12
Computing and communications in the 1980s, Martin Slingson Research Associates, Park Lane

Soccer results

Division 1
Aldershot 6, SIA 1
Aldershot 7, Datascan 2
Datscons 4, Atkins 4

Division 3
Computer Wkly 4, ICL 2
Computer Wkly 4, 3Ma 0

Hotel, 36 Central Park South, New York.

SEPTEMBER 17
An afternoon with James Martin, IBM CUA and Butler Cox Associates, The Grosvenor House Hotel, Park Lane, London.

SEPTEMBER 17-19
Fourth international conference on software engineering, IEE Computer Society, Munich, Germany. Contact: Prof Fritz Bauer, Institut für Informatik der Technischen Universität, D-8 München, 2, Arminstrasse 21, Postfach 90 94 90 Germany.

SEPTEMBER 21-22
Database technology for large, distributed and intelligent databases, ACM German chapter, Bad Nauheim, Kurhaus, Germany.

SEPTEMBER 24-25
Computer software requirements, TMSA, London, Tel 01 242 4045.

SEPTEMBER 26-27
Which terminal? Buyers, forum, Infotech, The Royal Centre, Carillon Street, London W1 9JH.

Manager in Midlands

Lee Walkinshaw has been branch manager for Computer People Midlands, part of the CPU group. He was formerly European marketing manager with Univac where he was responsible for the launch of its BC17 small business system in Europe.

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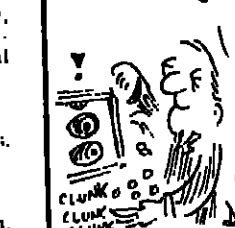
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CLUNK & CLUNK & CLUNK

By Judith Morris



The NCC's education officer George Penney (left) becomes a full-time member of the IDPM's council, following the close of nominations last week. The present chairman Neville Taylor (centre) and secretary-general Ted Cluff (right) were re-nominated. The council will decide the allocation of portfolios at its first meeting.

Move to make Cluff's IDPM job full-time

A MOVE is to be made tonight, July 26, at the annual meeting of the Institute of Data Processing Management, to make the secretary-general's job full-time.

The meeting, which is being held at the Royal Horseguards Hotel, near Charing Cross Station, at 4.30 for 5.00, will be told that even the 30 hours per week spent by the present job holder, Ted Cluff, is insufficient and that the Institute income of £80,000 is large enough to afford a full-time appointment.

Nominations for the 15 positions on the Institute's council closed last week and the 13 candidates are elected unopposed. The council has the power to fill the other two vacancies by co-optation.

The NCC's education officer, George Penney, is now officially a member and the offices of chairman, secretary general and treasurer will be filled from the new council.

Nominations were: Ted Cluff, Neville Taylor, Jimmy Macintyre, Nigel Laurie, David Bale, Ollie Davidson, Mike Eaton, Jack Gelly, Roy Hill, George Penney, Vic Thorogood, Fred Thomas and Ewan Robertson.

The last two nominees are new to the council and all members are elected for a three year term with one third of the members re-submitting themselves for election each year.

Bob Marshall has been appointed computer centre manager in charge of Com-caster's service centre at Doncaster. He was previously centre manager at Edinburgh, where he is succeeded by Harold White, formerly head of operations for the Gateshead centre.

Dr Russell Bromley has become sales director UK at Gylling Elektronik-Produkt AB, Oskarshamn, Sweden. He has worked for ICL since 1968 in Kildgrove and Manchester as a sub-contract manager.

Mike Jenkins, of Siliconix, has become product marketing manager for ICs for the whole of Europe and the UK. He was formerly a marketing engineer with the company. David Owen has been appointed product marketing engineer for discrete devices for the UK and Scandinavia. He recently joined Siliconix from General Electric where he was responsible for European product marketing.

Michael Russell has been named as data processing manager for Unichem. He joined the company in 1977 as assistant data processing manager, and was a member of the team that introduced the ordering system, Prosper.

James Bowle has become computer product manager for the Exchange Telegraph company, Exel. He joined Exel as sales engineer from GEC Reliance Systems, where he was responsible for selling internal communication systems.

Richard Cox has joined Merlin Gerin (UK) as field sales engineer for the company's programmable controllers. He was formerly a sales and contracts engineer with GEC Measurements.

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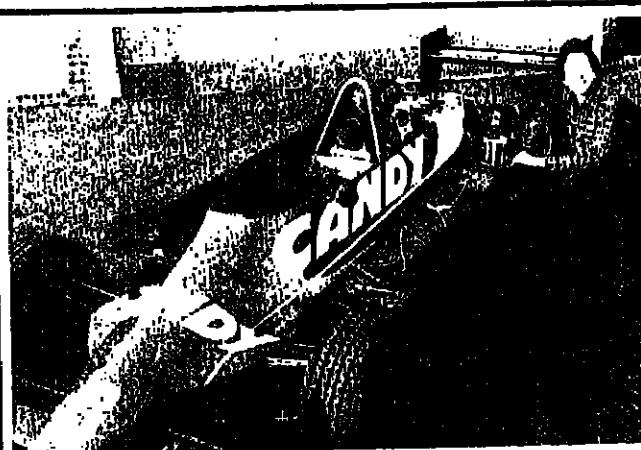
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Dr Kempf demonstrates where the recording equipment is fitted to the Candy Tyrrell Formula 1 racing car.

Monitoring car performance

"If the driver has time to look at instruments, he's playing about," says Dr Karl Kempf head of a project at the Tyrrell Racing Organisation to research into racing car and driver performance that includes a mathematical model of the driver as a black box information processing subsystem.

The team uses Motorola 8800 family microprocessor devices to collect, reduce and process data from transducers monitoring tyre heat, body aerodynamics, suspension deflection and other aspects of chassis and power train behaviour.

Kempf is to talk about the use of the team's findings in racing

car development at the Design Engineering Conference at the National Exhibition Centre in Birmingham on October 22.

Meanwhile amateur motor rally navigator Malcolm Cann, a member of ICL's project team at Barle, is working out how to use a Nascom-1 with 8K bytes of RAM to aid his rally performance.

He wants the system to give him a continuous LED display of average speed, distance to go next checkpoint and other essential information to feed to his driver, his wife Rene, on their rallies with the Farnborough and District Motor Club.

Protect privacy with licences—IDPM survey

LICENSING of personal data applications rather than registration would be necessary for effective protection of privacy, in the view of the majority of respondents to the IDPM survey of reaction to the Data Protection Report.

Of nearly 400 replies, 53% disagreed with the report's espousal of registration, thinking that more rigorous and formal controls would be necessary.

The survey (CW, February 22) was compiled by the IDPM in collaboration with Computer Weekly, and was sent out to all of the Institute's 5,000 members and to over 100 non-members who asked to reply. The results are being published in book form, after submission to the Home Office.

Many of the respondents indicated in comments that registration, with its lack of supervision, would be "too weak" and "demonstrably useless", but others said, "Licensing would make the regulations a bigger problem than the invasion of

privacy", and "Licensing suggests even more persons checking information thus defeating the notion to protect privacy".

Those surveyed saw plenty of practical difficulties in implementing privacy laws. One of these would be in obtaining consent from data subjects for the processing of data, and another would be in ensuring that print-outs provided to subjects did in fact contain all the information on the file.

There was plenty of agreement with the notion that manual files also posed a threat to privacy, and a good many respondents thought these too should be regulated.

Several of these last, however, put themselves in an impossible position by affirming at the same time that there were too many manual systems to regulate.

Most of those replying were DP managers. Not surprisingly

they felt strongly that the should be more than one expert on the Data Protection Authority and 81% thought such a body as the IDPM should be closely involved with the Authority.

The estimate in the Data Protection Report that £20 a year would be an economic registration fee was treated with scepticism. A figure at least double this would be necessary to cover costs, said many respondents.

Post Office computer centre strikers reject 18% offer

POST OFFICE staff on strike at the Leeds and Harmondsworth computer centres have unofficially rejected the latest management pay offer of about 18%.

The offer was for a 9% increase with 7% for productivity,

plus a further 2.25% in shift allowances.

The Society of Civil and Public Servants will vote on the offer next week, but the computer staff have voiced early opposition to it, as it is reported that they are wary of the Post Office offer. This is because the finer points of the deal such as shift payments, co-operation in clearing the telephone billing backlog, and promises of no victimisation still need to be resolved.

Clearing up the telephone billing backlog is a big job, as it now stands at over £20 million. The Post Office has manually sent out bills for £181 million of this, but the SCPS says that the corporation has only received just over £80 million as a result.

"It is certainly getting enough cash to finance its borrowing, for another 12 months at least," said an SCPS spokesman. "The problem is that even if full normal working is resumed tomorrow, the billing backlog will continue to grow for a month or two. It could reach £900 million before it begins to fall."

"The two important factors in the Post Office attaining a normal cash flow again will be co-operation from the unions involved in the dispute and the unknown quantity of computer system failure as a consequence of overloading."

Such an event occurred earlier this year when a software restriction on the ICL System 4 at Leeds caused problems.

An added complication is that the majority of telephone billing

in certain areas is still done using Leo 320s. The Post Office is trying to remove this by developing an ICL DME, so enabling it to use the 320 on an ICL 2900 mainframe.

The Post Office has been accused of "unreasonable monopolistic practices" by National Utility Services, a trade union which is demanding money-saving methods using telephone and telecommunications equipment. NUS because of the threat some customers are being wait for more cost-effective equipment to be installed.

Bid to slow down Aussie technology

STRIKING telecommunications engineers in Australia raised the spectre of industrial action next year: bid to slow the introduction of new technology.

Members of the Australian Telecommunications Employees' Association, fighting solely for pay but this has resulted in a relatively minor problem.

Because of an acute forecast of demand for telephone lines there have reports of a shortage of modems, but there is an excess of 1,200 and 2,400 bps lines.

Amdahl profits \$1.2m despite warnings

HAVING warned that its second quarter figures would be dire, Amdahl Corp provided some comfort for its investors by achieving a net profit of \$1.2 million, and by maintaining the dividend at 10 cents a share.

Last month, Amdahl warned that profits would be sharply down because of the strong tendency towards leasing rather than purchasing, and said that it might only break even in the second quarter (CW, June 21).

Less encouraging was that while shipments were ahead of those for the same period of 1978, they were below company forecasts. The sharp decline in sales was reflected in turnover down 23% at \$66.5 million. Outright sales show up immediately, whereas lease income is spread over the term of the contract.

In the second quarter of 1978, Amdahl had net profits of \$1.1 million. For the first half of the year, profits were down 28% at \$1.4 million on turnover up 8% at \$144 million.

Other companies reporting second quarter figures include Honeywell, CDC and NCR, and

all were substantially above the comparable period last year. Honeywell's net profit was up 39% at \$81.3 million on turnover up 15% at \$890.7 million. It well reported that profits on the computer side of the business showed a substantial increase and that the order backlog for computers remained at record level.

At Control Data, profits were up 53% at \$37.8 million on turnover up 16.8% at \$772 million, while at NCR profits were up 28% at \$17.6 million on turnover up 17.6%.

Heading for a fall

INFOTEK in the US has announced that it expects a net loss of \$3 million in its second quarter. It has also reported a 150% increase in revenue in the UK. The company's revenue was up 150% to \$1.5 million on turnover up 150% to \$1.5 million. The company's revenue was up 150% to \$1.5 million on turnover up 150% to \$1.5 million.

'Prepare for the Information Society or face unemployment'

THE education system is facing a colossal challenge society must be enabled to cope with rapidly changing technology, or it will be torn apart by disaffected young people, in the view of Professor Tom Stonier of Bradford University, who spoke at a conference there on Education for the Future.

At the same time, Stonier pointed out, formal school education is becoming "increasingly irrelevant" through the "by-pass" effect. Parents are increasingly worried about opportunities for their children

are buying their microcomputers and calculators like the "Little Professor," and as a result children are coming to school knowing more than their teachers, in subject areas such as computers specifically.

Stonier was reiterating his thesis that the education system must be mobilised to prepare people for a massive switch to the Information Society, in order to avoid large-scale unemployment (CW, June 21).

He envisages a world in which 90% of the people work with information rather than in making things, but there is a major problem, in his view, in that economists have no concepts to deal with the creation of wealth by knowledge. Most are still "neo-physiocrats," preoccupied by the importance of land and capital, he thought.

It is knowledge, Stonier said, that could enable the UK to produce large quantities of

HOOPER... "Human teachers are fundamentally more capable than computers."



single-cell protein from coastal fish farming and thus become a food exporter, or to produce oil from coal or electricity from the waves. This knowledge will be the basis of the Information Society, making previously unproductive resources productive.

Also speaking at the conference was Richard Hooper, formerly director of the now-defunct National Development Programme for Computer-Aided Learning, a quango actually signed into being by Margaret Thatcher (when she was Education Secretary). Hooper wryly pointed out, CAL is still very weak and under-used, even in the US, Hooper said, and there were many reasons for this.

Principal among these, Hooper thought, were the lack of software and the lack of commitment on the part of schools to provide the time for teachers to construct more programs.

CAL is still inflexible in that constructing the learning trees is tricky — it involves "pre-specifying the educational act." Human teachers are fundamentally more capable than computers in that they can understand questions that they did not know were coming, he said.

Hooper did insist that the view of teaching by computer as "dehumanising" is unfair. "Why does no one think books are dehumanising?" he asked, pointing out that at least computers provide some feedback.

Turning to education about computers, Hooper claimed that

THE white-collar union ASTMS is hoping to raise the consciousness of both the general public and its members about the impact of new technology.

In September a Press and poster campaign is to be launched on the effect of the microelectronics revolution on our lives. It may draw some inspiration from The Collapse of Work, a recent

book co-authored by Clive Jenkins and Barrie Shemen. In December, ASTMS is to run a course on new technology at its Whitwell College. Aimed at senior office representatives, the programme covers the development of new technology and its impact on office jobs, particularly with regard to job security.

many teachers working on this did not know what business they were in. Was it mathematics or the social impact of technology they were dealing with?

One point Hooper felt strongly about was that Computer Appreciation courses should not be in the mathematics department. There is too much anti-vocational and anti-relevance bias in formal education in the UK, he said.

There is, however, a distinct shift in educational funding now, away from the DES and towards the Manpower Services Commission's training budgets, partly to get away from this bias against practical training.

The conference heard several

teachers describe their experience in using computers to teach other subjects. A project on local history in Suffolk had involved the encoding of sizeable chunks of mid-19th century census returns on an ICL 1903 at Ipswich Civic College. This enabled children to find the answers to large numbers of questions on occupations, place of origin, and so forth.

Beverly Labbett from the University of East Anglia was enthusiastic about the educational potential of the "bare-bones information" the computer can provide. This stimulates children to ask questions they would not otherwise have asked, and to formulate hypotheses.

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Some unethical sales techniques

FURTHER to Trader's Sales Bit (CW, July 5), headed, "The way to preserve integrity in selling activities," I have been selling systems and programming support on a time and materials and fixed price basis for a major software house for nearly one and a half years and am pleased that you printed "30 Commandments for Salesmen".

I trust that certain people in our industry take note and perhaps I can outline other methods of unprofessional and unethical selling that are sometimes used by a few of the so-called professional software houses and agencies.

On two separate occasions this year I established program-

ming requirements with prospective customers. Having established our company's manpower resources I profiled suitable, technically qualified staff. On both occasions the candidates profiled, who were currently working for me, had been duplicated by other companies. Clearly these companies had obtained the same requirements but did not have suitable candidates available, so profiled people without first discussing the matter with them. Perhaps "a sprit to catch a mackerel", but embarrassing to the client, the candidate and my company.

Another area for concern is the way in which some agencies and software houses delib-

ately "doctor" CVs to ensure that candidates are at least interviewed by the customer. Fortunately, in most cases the "grey area" is exposed during the interview. However, if the sales approach is professional and convincing enough, and the candidate is suitable, it should not be necessary to mislead the customer and bring the service industry into disrepute.

Could it be that financial reward for achieving sales targets is the reason for the dubious approaches outlined?

If this is so, perhaps we should all think again and consider both the short and long term implications of approaching sales in this manner, and also bear in mind my own philosophy: "Client satisfaction is my most important product."

MIKE DOHERTY

Hanwell,
London

SCERT still marketed

I HAVE just finished reading the article, "Is your performance up to scratch?" (CW, May 31). I wish to call your attention to an inaccuracy that appears in the accompanying piece. "Users must know what to measure."

The article's author stated that SCERT (not SKIRT) "is no longer marketed." This in fact is false, as Performance Systems Incorporated (PSI) has con-

tinued actively to market the SCERT Performance Prediction System since acquiring it from Comten Inc in December 1977. PSI has many domestic SCERT clients as well as several clients in Europe.

H. FRED SILVER,
Vice President
PSI,
Rockville,
Maryland, US.

Please write...

THE EDITOR welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

LETTERS

To: The Editor, Computer Weekly,
Dorset House, Stamford Street, London SE1 9LU

Updating tax tables properly

THE article by Cliff Dilloway, "Updating your payroll programs" (CW, June 21) calls for comment on two points.

In his second paragraph he refers to "the tax tables proper", which may give some of your readers the wrong impression. He was referring to the manual tax tables, as distinct from the recently issued Specification for PAYE Tax Table Routines. I wish to make clear that the latter has the same legal validity as the manual Tax Tables.

Later on in the article Cliff

Dilloway makes the point that the logic changes contained in the new Specification do not have to be achieved by any particular date. While that was true at the time he was writing, "Notes on PAYE for Computer Users - Series 6 Number 2" issued last month indicated that the changes should be effected from April 6, 1980 at the latest.

G. O. LAWTON
for Assistant Director
Organisation Division M3/2
Inland Revenue.

The micro mystery

RECENTLY I came across an article in Autocar, June 18, where once again the mysteries of the micro chip were explained to the readers:

"The silicon chip, or micro-processor, call it what you will, is said to be a threat to our working lives. Whole factories will be run by a box of them,

watched over by a lone white coated technician."

It's not difficult to imagine an advertisement in the future: "White coated technician required urgently to mind busy chip shop."

B. G. LOKOS
Leeds,
Yorkshire.

DPMs: Worlds apart?

WE found your Computerview (CW, July 12) particularly relevant to our own first-time user market in which we have specialised for over seven years as a business, and over 10 as a set of individuals. During this time we have had many happy hours discussing system requirements with data processing managers but must confirm the impression

given in your article that often the data processing department is worlds apart from the needs of the users. Let us hope that the common sense generated in your article does become commonplace.

ANTHONY D. HODGE
Principal Consultant
Systems Consultancy,
Chelmsford, Essex.

Suppressing technology in the computer industry

STRONG pressures exist in our society towards suppressing high technology. This can partly be characterised as "fear of the unknown". These pressures have somewhat relaxed due to the TV programme "Now the chips are down", and the government's strong reaction to it.

The weakening of the above barrier makes it important to take a step closer, and look at an analogous pressure within computer technology itself.

Computer technology is 98% staffed by people with no knowledge of engineering (or physics). These "technology-free" people have a fear of computer hardware which correlates with the previously discussed general public's fear of computer technology.

Management in industry, and also the politicians, being technology-free and fearing the technocracy as a potentially competing power base, are motivated to "bureaucratise" computer technology - to turn it into a paper, programming, technology-free activity.

It is important to study this "lateral arabesque", where programming, i.e. the contemporary clerk's occupation, masquerades as high technology/microelectronics, wave of the future, Britain's last hope, etc.

technology titles: Computer science - contains no science.

Software engineering - contains no engineering.

Fault tolerant software - implies hardware content, but contains none. Also, fault tolerant programming is impossible anyway. More reliable systems can only be achieved through engineering.

This bureaucratisation of computer technology cuts us off from the major growth industries of the future, which include:

1. Airline collision avoidance.
2. Systems for sensing and improving traffic flow in the cities.
3. Most of the medical electronics industry.
4. Real time school, bus and train re-timetabling in response to emergencies and user demand.

Each of these industries will be larger than the total "informatics". Von Neumann, conventional programmer based industry that we seem to propose to restrict Britain to.

Programmers with very little knowledge of physics and engineering control all the "Computer Science" faculties and departments in Britain. There is a very real risk that, with the help of government (diverted from its attempts to support high technology and microelectronics)

Algol 68 points made clearer

I AM writing to correct a small inaccuracy in your comprehensive report of the Algol 68 implementations at the S. West Universities Regional Computer Centre (CW, May 14). Both 2800 Algol 68 and 2800 Algol 68 are implementations based on the RS Pascal 68 compiler written, owned by RSRE, Malm. "Algol 68 RS" is the name of the portable compiler which should not be used to describe any of the production implementations from it. An introduction to the RS portable compiler, written by S. G. Reed, P. M. Woodward, is available from RSRE as Technical No 802. The RS compiler is entirely in Algol 68.

The project manager for Multics Algol 68 compiler, Rees, the project manager for the 2800 Algol 68 is G. O. Lawton.

Algol Bulletin 41 (July 1978) listed 17 Algol 68 implementations, either released or various stages of development. Of the ones you mention, RS was written by F. Malmsten, not by Malmsten, your state, although Malmsten uses the compiler on his Lindsey at Manchester. It is possible that for Algol 68 for the MUSE Algol 68.

Finally, many of you may have been puzzled by a cryptic remark that "reference from PL/I is that of being permissive, Algol deliberately restrictive". A subject which really needs to be added to itself. Could it be, perhaps, that a short article subject to put the rest in context?

MARTYN THORP
Systems manager,
South West Universities
Regional
Computer Centre,
Bath.

INTRODUCTION TO PASCAL

Top down to the main program

Part 5

THE object of this section is to define completely the data structures needed by the Time Checker program and to write the "main program", or in other words, the statements between the program's BEGIN-END pair.

The Statistics file

Following the top-down approach, let us consider what output is required. There is the error report, but that is liable to be messy (errors always are) and not an optimistic place to start. It is far better to look at the principal output, the Statistics file. This is to contain all the Flexitime data since the last analysis. The top-level definition of the file is very simple, namely:

VAR statistics = FILE OF flexidata;

Pascal files are sequential with all elements in the file being of the type specified. This does not mean that all the elements are identical because a RECORD type may have variants. However, such power is not needed for a simple file of groups of times.

Now what is flexidata? Each employee clocks on or off four times a day and this information is needed to analyse daily patterns. Furthermore, the week number would be useful because there may also be seasonal patterns, such as people arriving later in winter. This leads to:

```
PROGRAM timechecker(input,output,statistics);
TYPE
  hours = 0..23;
  days of the week = (mon,tues,wed,thurs,
    fri,sat,sun);
  time = PACKED RECORD
    DAY : days of the week;
    hour : hours;
    min : 0..59;
  END;
  onoff =
    (inmorn, outmorn, inaft, outaft,
    ineven, outeven);
  onofftimes = ARRAY[onoff] OF time;
  flexidata = PACKED RECORD
    week : 1..52;
    times : onofftimes;
  END;
VAR
  statistics : FILE OF flexidata;
  clocking : flexidata;
BEGIN
  rewrite(statistics); (* open it for writing *)
  read(clocking,week);
  WHILE NOT eof(input) DO
    inputtimesforoneemployeeforoneday;
  END
```

Figure 1. The Time Checker, Mark 1

```
TYPE flexidata =
  PACKED RECORD
    week : 1..52;
    times : onofftimes;
  END;
```

That, too was easy; the real crunch comes in defining on-off times.

Four times in a row

There are four instances during the day when an employee should pass the gate. Let's define these as

```
TYPE onoff =
  (inmorn, outmorn,
  inaft, outaft);
```

We might regret this later if Blaze decides to go into shifts and an outafternoon time is given as 08:00. However, such a move is believed to be unlikely and would not upset the program, only the aesthetic tastes of the programmers.

Onoff gives names to the four times in question. To group the times themselves together we can use the oldest of data structures, the array.

```
TYPE onofftimes =
  ARRAY[onoff] OF times
```

This definition states that onofftimes is a type which is basically an array of four elements each of which is a record of the type time. To put this all in perspective, consider a variable

VAR clocking : flexidata;

The time this particular employee went off at the end of the day would be given by

```
clocking.times[outafternoon]
```

The actual hour he went off is obtained by selecting the hour component at the end, as in

```
clocking.times[afternoon].hour
```

The whole group of times can be moved around by naming

```
clocking.times
```

or the group for the week would, of course, be called simply

```
clocking
```

The weekly input

Since we decided that the data will be processed weekly, it makes sense to start off the data with the week number. Following that will be lines consisting of the hour and minute when the employee passed the gate. Mentioning the day four times seems wasteful but does have advantages.

1. It provides room for checking the times for inconsistencies.

2. It does provide for shift work later (eg coming on on Tuesday night and going off on Wednesday morning).

In keeping with the top-down approach, we will not specify the precise form of the times yet and go straight on to writing the main program. It is all in Figure 1.

Getting it in

Two of the three statements in the program concern input/output; they will be explained now. Rewrite, and its counterpart read, are used to open files for writing and reading respectively. The standard files, input and output, are opened automatically and it is invalid to use read or rewrite on them.

Read is the general-purpose and, indeed, all-purpose input



By Dr Judy Bishop

In the fifth of her 10-part series, Introduction to Pascal, Dr Judy Bishop defines the data structures needed by the Time Checker program, and to write the main program.

A lecturer in computer science at Witwatersrand University in South Africa, Dr Bishop first became acquainted with Pascal when she was studying for her PhD at Southampton University.

statement. If the first word in parentheses has been defined as a file name, then reading is done from that file otherwise input is read. Pascal's reading is type-driven or, to use an older term, free-format. Read considers the type of the variable and expects a value of that type to be the next on the file. Thus

```
read (clocking,week);
```

expects an integer between 1 and 52. Some compilers do not give read the power to check subranges but in principle they should. As in the program itself, spaces and ends-of-line are ignored before a number. If Time Checker is being run on week 23, then 23 can appear anywhere on the first line.

"Numbers" with letters

The next item that will be read is an employee number. At this point the input marker is on the character after the 3 (which should be a space). It is now important to know what this employee number looks like. If it is purely digits then the appropriate

```
read (employee, number);
```

will skip the rest of line one and pick up an integer from line two. However, it is far more likely that Blaze Inc uses the word "number" much like Humpty Dumpty... "When I use a word it means what I want it to mean."

The fact is, that employees are known by an identification tag which consists of the initial of their surname followed by a genuine number. In Pascal, this is

```
TYPE identification = RECORD
```

```
  initial : char;
```

```
  number : 0..maxint;
```

```
END;
```

For example, D. E. Mullins might be employee M2610. Note the careful use of a subrange for the number component. Since it is obvious that this will never be a negative number, we might as well tell the compiler so and let it build in a check against this happening. Maxint stands for maximum integer and is a constant defined by most implementations.

```
WITH employee, idnumber DO
```

```
  read (initial, number);
```

Reading a character picks up the very next one on the file. But wait! This is currently the space after 23. Therefore we must first position the input marker at the start of the next line. This is done by a readln (ie read line) statement so in fact, the reading of the week should be done by

```
readln (clocking,week);
```

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Although Electronic Funds Transfer Systems already shift more money by far than any other method in the US, other methods are still used for the bulk of cheque transfers and it seems likely that they will continue to be used. Various reasons are cited, among them controversy over privacy laws and the enormous cost of conversion.

However, use of EFTS is spreading fast, and some analysts believe that it could become the principal method of funds transfer within ten years.

In this article, MORRIS EDWARDS describes the various EFTS systems operating at present in the US, among them corporate EFTS, for money and message transfer between member institutions, Fed Wire, the network that carries Federal Reserve transfers, and retail EFTS which handle transactions between a bank and its customers.

WILL electronic funds transfer systems ever predominate? In the United States, at least, one might be tempted to answer "No," considering the substantial consumer resistance to electronic banking and retailing, and the controversy over banking laws, security safeguards and privacy matters.

Yet, in dollar amount at least, EFTS is already the dominant payment mechanism in North America. In the US, for instance, financial institutions use EFTS to transfer about 80% of all payments, amounting to some \$275 billion daily.

To put the situation in perspective, though, it's important to note that these transactions

average about \$2 million each, and that non-electronic funds transfers involving cheques still represent the highest volume of transactions.

Even though US banks handle an estimated 30 billion cheques annually, there is no longer any pressure to convert to EFTS to prevent the banking system from "drowning in a sea of paper."

This was the anticipated problem that triggered initial interest in EFTS in the mid-1960s. Since then, however, banks have developed efficient non-EFTS technology for cheque processing, and many bankers believe cheques will be the best way of handling consumer payments

for the foreseeable future.

Also, whereas EFTS was initially conceived as the ultimate in consumer convenience, concerns over privacy, security and such matters as "float" have raised questions as to whether EFTS networks are needed or can be afforded.

If financial institutions could eliminate cheques through EFTS, the processing cost of 30 cents per cheque could conceivably be cut by as much as 80%. However, EFTS would have to be used universally to obtain the anticipated savings, and the upfront investment would be staggering.

In view of the costs involved and consumer attitudes to date,

some industry analysts feel that a full-scale EFTS network may never arrive. Others argue with equal conviction that systems promise too many benefits for too many people for it to be halted.

One study by Arthur D. Little indicated that, within the next decade, EFTS could become the dominant payment mechanism in both transaction volume and dollar amount. Little reckons that EFTS transactions will represent 17% of all transactions by 1980 and 70% of all transactions by 1990.

While one roadblock after another has snarled development of full-scale EFTS networks for consumers, financial institu-

tions have profited from the availability of advanced communications networks for rapid and secure funds transfers among themselves (corporate EFTS). On the international scene, the principal networks for corporate EFTS are Chips and Swift.

Chips, an acronym for Clearing House Interbank Payment System, was established by the New York Clearing House Association in 1970 as a means of eliminating cheques as a payment medium for international interbank transfers.

Currently, the network is handling interbank money transfers of \$100 billion a day at the request of US and foreign banks, involving an average of 45,000 transactions. To handle this traffic volume, Chips employs 350 terminal computers, located in varying numbers in the 80 participating banks, all of which must be physically located in New York City to qualify.

Leased telephone lines link the terminal computers to a Burroughs B6700 triple processor system in the Clearing House computer centre. As the transactions and messages are processed, the central computer updates pertinent records in its disc and memory files and produces balance position reports and item-by-item detail reports at the end of the day.

Unlike CHIPS, which functions as an automated clearing house for interbank money transfers, SWIFT is not a funds transfer or interbank settlement system. Rather, it is a message system established as a computerised link between European and North American banks. It is remarkable in that it represents agreement among European and North American bankers to standardise communications interfaces and formats to handle a wide variety of international transactions.

Fully operational since 1977, SWIFT now links over 570 banks with about 1,000 branches in 17 European countries, the US and Canada, and handles over 114,000 messages daily. According to Peter N. Drummond of the SWIFT organisation in New York, Japan will be joining the network "in the next year or so," and he says that many other countries have expressed interest in doing so too.

Each country utilises a Burroughs computer configured as a concentrator, which receives input from domestic banks on a variety of private and dial-up lines. Most concentrators connect to one of two switching centres. In Amsterdam and Brussels, over leased lines operating at 9,600 bps.

For smaller, neighbouring countries with limited traffic, the concentrators are typically connected in series and share a link to the switching centre. Reportedly, a third switching centre will soon be added to the network in Culpepper, Virginia.

Culpepper is also the location of the switching centre for Fed Wire, the name given to the network that carries Federal Reserve transfers. Fed Wire uses a star-type network to link all 12 Federal Reserve Bank head offices to the Culpepper switching centre. Each head office is also the centre of star-type sub-networks which connect 25 Fed branches and more than 200 member banks into Fed Wire.

According to Howard Crump,

adviser to the Federal Reserve Bank of New York, the long-range goal with Fed Wire is to replace the centralised star-type configuration with a distributed packed-switched network. At present, the Culpepper centre switches 58,000 transactions daily, transferring an average \$150 billion in Federal Reserve funds and government securities between member banks at the Federal Reserve.

Since September, Fed Wire has also linked all 32 American Clearing Houses into a wide electronic payment network. Through the network, consumers and corporations

By Morris Edwards



now make use of ACH services such as direct deposit and automatic bill payments anywhere in the contiguous states.

ACHs are institutions analogous to the clearing houses for the interchange of cheques, except that transactions are carried on magnetic tape rather than on paper cheques. Two types of payments move through ACHs: payments, such as security or wage payments, which result in a deposit to an individual's account; and debit payments, which transfer funds from an individual's account to that of a creditor, for example, an insurance mortgage payment.

One controversy surrounds ACHs is the role of the Federal Reserve, which operates the New York ACH. On the other hand, the Privacy Protection Study Commission recommended that no government agency play a part in a system because of potential threats to personal privacy.

On the other hand, proponents of Federal Reserve operation of ACHs argue that it is simply an extension of the traditional role of clearing houses and that no government institution would be without reasonable cause. It was pointed out that the National Automated Clearing House Association (NACHA) is a non-profit organisation which has been working for several years to develop a national clearing house without government involvement.

Despite the US situation, Fed Wire in the UK has been developing a similar network for interbank transfers without government involvement.

Bank Wire, for instance, was established in 1952 by 13 Chicago and New York banks to transmit funds transfer and administrative messages to more than 230 participating members. Last year, Bank Wire II took over the funds transfer activity among the 185 member banks, providing them with improved reliability, accountability and flexibility.

Developed over three years at a cost of nearly \$10 million, Bank Wire II operates 30 times faster than its predecessor system. It is currently processing more than 18,000 messages daily, involving funds transfers in excess of \$20 billion, though it can accommodate more than three times this payment message volume.

While the communications facilities are in place to handle corporate EFTS, no such integrated nationwide network exists for retail EFTS. Conceivably, one could be built on Fed Wire or Bank Wire, but a single network raises Big Brother issues as well as fears that the nation's 14,300 banks and 7,000 thrift institutions might be consolidated into as few as 100 national organisations.

Some observers feel that EFTS cannot bloom fully until the independent datacomm systems established by retailers, banks and thrifts, the Fed and corporate America are somehow tied together. Others argue that EFTS is best handled by a multitude of computer networks. Whatever the relative merits of the two approaches, retail EFTS has historically developed on a local, or at most a state-wide level, and with only a few of the possible EFTS options.

Few financial institutions

'Expectations are clouded by lukewarm attitudes'

Also in New York, Chase Manhattan is pioneering another EFTS area — Giro-type processing of authorised payments to organisations such as retailers and life insurance companies via ACH debits. Chase vice-president George White, a well-known advocate of electronic Giro systems, explains that the concept requires the payer to initiate the funds transfer by ordering a payment to be made from his account. As such, it is the exact opposite of the cheque mechanism, where the actual transfer of funds is triggered by the person who receives the cheque when he cashes or deposits it.

European Giro systems are often handled by the country's PTT. White points out, with financial accounts maintained at the postal services and payment instruments moved physically. In the United States, however, Giro systems would typically use an electronic payment infrastructure such as ACHs.

Another approach to limiting paper flow is cheque truncation, where cheques are microfilmed

'Identifiable and long-lasting trends are developing that will affect both financial institutions and the industries that service them...'

could afford the investment that Citicorp has ploughed into its electronic banking operation, known as Citicard Banking Centres, or CBCs. Over the last ten years, it has spent about \$100 million in developing the electronic system.

Most of the CBCs are located in Citibank branches, though a few of them are in stand-alone kiosks. Most contain two Customer Activated Terminals, or CATs, which customers may use to deposit and withdraw cash, transfer funds between chequing and savings accounts, mortgage and bank card accounts, and find out their account balances. Getting into the bank after regular hours involves inserting a plastic Citicard into an electronic door-opening device. The same card activates the automatic teller machine when used with a personal identification code.

Citibank uses an electro-optical reading technology imbedded in its card, which the bank feels is substantially better than a magnetic stripe since it cannot be copied as easily and is harder to scratch or damage. A wholly-owned subsidiary, Transaction Technology in Los Angeles, developed the CAT, which is more efficient and sophisticated than a conventional automatic teller machine, providing simple, step-by-step instructions to lead the customer through the various transactions.

"Contrary to some predictions, the machines don't intimidate people one bit," says Richard Kovacevich, senior vice-president. "More than 88% of customers who have used them once use them again." Kovacevich also reports that the CBCs are handling transactions at the rate of almost two per second every day and that about 40% of all CBC usage is during normal working hours, indicating that customers are using them to avoid queues at teller counters and to save time.

by the payer bank and then destroyed, with the customer receiving all "pertinent information" regarding the cheque but not the cheque itself as a record of the transaction. Ultimately, this concept is expected to lead to truncation at the bank of first deposit since this will save the banks more money.

In this case, the cheque will be microfilmed and destroyed by the bank where it is first deposited and the pertinent information entered into the bank's computers; subsequent transactions involving the cheque will be handled by communications between computers at the various banks.

Not surprisingly perhaps, there has been little progress to date in implementing cheque truncation in the retail EFTS environment — and having it accepted by consumers — though many firms are utilising these concepts for corporate funds transfers.

In the face of uncertain legal and legislative outcomes and lukewarm consumer attitudes, what kind of future can be expected for EFTS in the US? According to International Resource Development of New Canaan, Connecticut, while the near-term expectations for EFTS are clouded by uncertainty from several areas, identifiable and long-lasting trends are developing that will affect both financial institutions and the industries that service them.

In its report, Data Communications and Banking, IRD lists the following developments as likely to evolve over the next decade:

- Formation of a national ACH network sponsored and encouraged by government programs emphasising pre-authorised payments and charges to reduce anticipated paper volume. Such a network will be competitive with, but will not replace, traditional processing operations.
- Development of national



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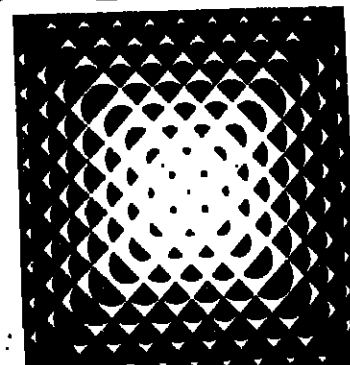
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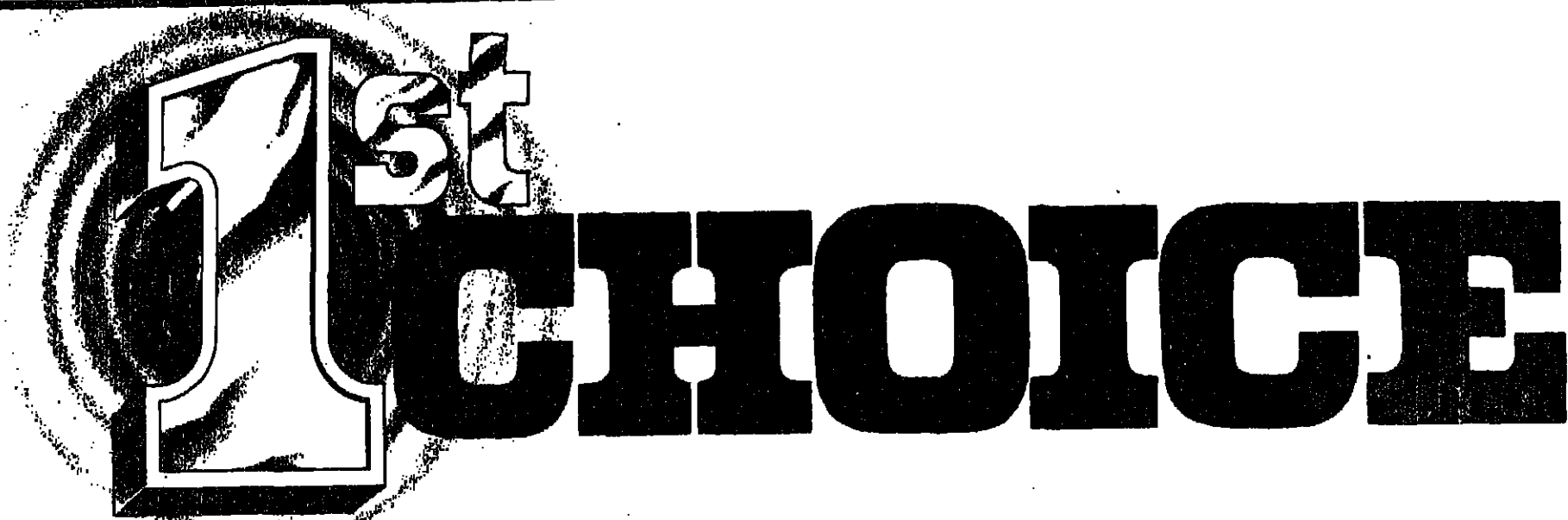
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Salary range: £3775 to £5488 (011079 scales). Requests (quoting Ref. G) for details and application forms to Personnel Section (Academic), UNIST, Cardiff, CF1 3NU.
Closing date: August 24, 1979.

UNIVERSITY OF SOUTHAMPTON MEDICAL RECORDS PROGRAMMER

Applications are invited for a

PROGRAMMER

to work in a small team for a medical records system. The successful candidate will be working with a robust and well documented system in the role of programmer, operations control and user liaison. The system serves a major research project for the department of Primary Medical Care at the University of Southampton, and is on a CIL Module-1 linked to the University ICL 2970. Several microprocessor projects are also being considered.

Initially he/she will gain experience of the system, assuming responsibilities at appropriate times for extending and running the system and helping users. Candidates must have a good working knowledge of COBOL, and should be willing to learn, to be flexible and to take responsibility. Experience of assembler languages will be helpful.

Salary £3775-£4355 per annum dependent upon age and experience. Six weeks holiday per annum.

Letters of application giving details of qualifications and experience together with the name and address of two referees should be sent to Mrs. P. Vaughan-Smith, The Undersecretary, Southampton SDS SW1, as soon as possible. Please quote ref 1089/A/CW.

University of Edinburgh Centre for Educational Sociology PROGRAMMER

Research Associate (Computing) required by social science research group to assist the Research Fellow (Computing) with administration of surveys, production of SPSS data files, computer-produced documentation and information retrieval induction courses for beginners, and general work on data management. Graduate required, preferably with solid work experience or a second degree in computing. Appointment to commence October 1st, 1979 for a fixed term of 3 years on scale Research 1A between £4,335 and £4,910 p.a. with annual increments. Those with full degree educational qualifications, work experience and the names of two referees to the Director, Centre for Educational Sociology, 7, Buccleuch Place, Edinburgh EH8 9JN.
Closing date August 17th, 1979. Please quote Reference 5042.

Analyst

Marketing Management Information

Sandvik Coromant, market leaders in carbide cutting tools, require a senior Marketing Assistant to work in the established Marketing Services Department at Halesowen. The successful candidate will be expected to make an early contribution to the analytical work of the department and to developing management information. Experience of ERP management information systems would be particularly relevant.

Applicants, male or female, should be aged over 25 and have a degree or equivalent in a numerate discipline. Industrial experience in an analytical marketing function is desirable, but an appropriate systems analysis background could be equally acceptable.

Competitive starting salary and a full range of large company benefits. For an application form please write or telephone with brief details to: Personnel Officer, Sandvik U.K. Limited, Manor Way, Halesowen, West Midlands, B63 3QZ. Telephone: 021-850 4700.

**SANDVIK
Coromant**

IRISH RECRUITMENT FEATURE

Advertisers are reminded that the next Computer Weekly area feature will be published on August 9 and will highlight career opportunities in Ireland.

Space reservations should be made as soon as possible to:

Owen Kelly — Manchester — 061-872 4211
Eddie Farrell — London — 01-261 8097

Copy Deadline: PM Friday before

COMPUTER WEEKLY
THE INDUSTRY'S WIDEST READ AND MOST REQUESTED NEWSPAPER

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday. Ring David Abbey for further details on 01-261 8010.

Software and Electronics

DESIGNERS

live up to your expectations with

SYSTEM X

PROJECT

A £ multi-million investment to meet British and overseas telecommunications needs through the 1980s and into the next century. Revolutionary in concept, it will transform public attitudes to communications. Of vital interest to software and electronics designers.

PROSPECTS

It would be hard to think of a more significant project - or one which might add as much to your technical development and career potential. System X is a huge British undertaking with substantial export possibilities for years to come.

LIVING

Apart from reasonably priced housing, the Liverpool area offers many unique attractions. In addition, the motorway network brings the North Wales coast and Snowdonia, as well as the Lake District, within easy reach.

CHALLENGE

In a modern purpose-built environment in Liverpool, the team is involved in a very wide range of state-of-the-art electronic technology - logic design, microprocessors, automated production and testing etc. The system is highly versatile in order to accommodate new technology as it develops.

REWARDS

Design engineers and software specialists with the experience, qualifications and ability to drive the project forward will start in a salary range up to £9,500 p.a. There is ample scope for promotion. Generous relocation expenses will be paid where appropriate.

ACTION

Take a look at our 'Information Package'. Ring Bob Wooding between 9am and 5.30 pm on Liverpool (051) 228 4830. He will send you the package and may put you in direct touch with our hardware and software team leaders. Alternatively, post the coupon to Ray Beeston.

To: Ray Beeston, Plessey Telecommunications Limited, Edge Lane, Liverpool.
Please send me the System X Information Package.

Name

Address

Home Tel No.

Present Job

Qualifications



PLESSEY
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MYRIAD

SENIOR ANALYST

TO LEAD DATABASE DEVELOPMENT FOR IBM4300 HARDWARE

MIDDIX. (HAYES)

£7500

Our client is a leading manufacturer and supplier of bulk plastic products for the building industry and is expanding at an impressive rate.

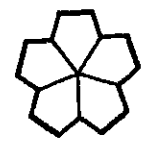
Their current kit comprises an IBM 370/125 soon to be upgraded to a 4331, with a 4341 on order for 1981.

The Senior Analyst will be required to build and lead a database development group comprising a skilled team of analysts and programmers. The person appointed should therefore be able to offer a sound analysis background, preferably gained in a manufacturing environment and, ideally, some experience of an IBM database management system. A programming background would also be advantageous.

This is an ideal opportunity for a person seeking career progression in a dynamic environment and further advancement to Project Manager status can be expected in the near future.

Ref. SW1/2807

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 (24 HOURS)



**SOUTH WEST UNIVERSITIES
REGIONAL COMPUTER CENTRE
UNIVERSITY OF BATH**

ALGOL 68 COMPILER DEVELOPMENT

Vacancies exist for two systems software programmers to join a small team developing Algol 68 compilers. The team has responsibility for future development of the ICL 2900 Algol 68 compiler, which has just been released and is already in use at a number of sites in the UK, and is also responsible for the development of a compatible compiler for Honeywell Multics systems. An additional person is sought for each of these projects.

The posts provide an exciting opportunity to gain detailed experience of compiler development, and to design and write software which will be used throughout the world. Both ICL VME/3 and Honeywell Multics are used interactively for development.

Algol 68 and compiler experience would be an advantage, as would knowledge of either machine's instruction set. However, the ability to learn quickly and work in a professional way is equally important, and recent graduates or postgraduates are encouraged to apply.

The posts will be for a period of two years, and salaries will be in the range £3775-£7521 (from October) plus a cost of living supplement yet to be agreed.

Further details and application forms, to be returned by 23.8.79, from the Personnel Officer, University of Bath, Claverton Down, Bath BA2 7AY, quoting ref. (79/175CW).

TYNE AND WEAR COUNTY COUNCIL COUNTY TREASURER'S DEPARTMENT

COMPUTER PROGRAMMERS

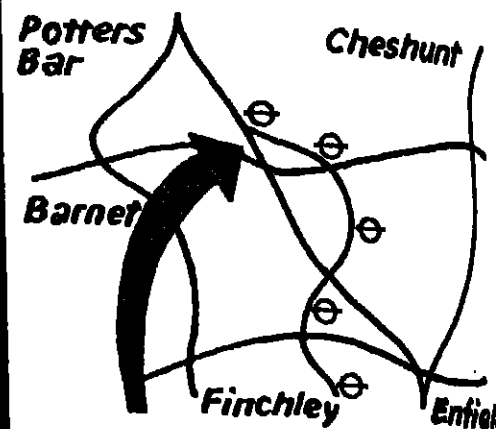
Salary up to £5,073 (Pay award pending)

Applications are invited from experienced personnel or from persons wishing to enter the programming field for the first time.

The successful applicants will join a highly skilled and experienced development team working on a wide variety of financial, administrative and technical computer systems.

The County Council operate an ICL 1804S computer with 256K core store, 11 EDS80, magnetic tapes and drums, which supports a communications network over 50 terminals, used for on-line processing, data capture and MOP development.

Written applications, stating age, qualifications, current salary and experience to date, and naming two referees, should be sent, not later than 3rd August, 1979, to the County Treasurer, Tyne and Wear County Council, Sandford House, Archbold Terrace, Newcastle upon Tyne NE2 1ED.



Our clients are located at Cockfosters, close to the Underground station (Piccadilly Line), and are facing a problem. Working conditions are congenial, and a favourable employment package is offered, including annual bonus and four weeks' holiday. Due to expansion, career prospects are good.

Currently, information systems for a unique service to the international shipping industry are being developed, including on-line applications using a mainframe with 250 MB on-line disc storage.

PROGRAMMERS Up to £5,500

Upwards of two years' programming experience on ANY MACHINE is required, including substantial COBOL. The job offers the opportunity of involvement in management levels, taking responsibility and using initiative. (Ref. 6889)

Please ring us in confidence for an initial discussion, quoting the appropriate reference. Messages after hours will be recorded.

EDP SYSTEMS LTD
52-53 Margaret Street, London W1M 0PX
Telephone 01.637 5796 (24 hours)

SYSTEMS PROGRAMMERS

GET TO THE CENTRE OF THINGS in Surrey

As a Systems Programmer with our client you might be involved in the replacement of MFT with OS/VS1; in seeing the implementation of VM is successful; in helping with the installation of 4300 hardware. You might be evaluating t.p., database or other software products or controlling their implementation; providing consultancy or technical support to users throughout Europe; or providing support for a major message switching network.

The data centre is based in East Surrey. Using Honeywell, GA, IBM, Prime and Datapoint minis, with IBM mainframes, services are provided for clients throughout Europe and the Middle East, opportunities will therefore arise for overseas travel. Significant changes are taking place and successful applicants will be a part of and will make a contribution to these changes.

Candidates should either have a good systems programming background in an IBM virtual operating system environment or have solid message switching experience. Knowledge of t.p. monitors, databases or SWIFT would be an added bonus.

As you can see opposite a first rate benefits package is offered, including a starting salary negotiable dependent on experience and you would be joining a well-trained and professional technical group. To find out more telephone Capp Associates.

Positions open to male & female applicants, please telephone (24 hour service) for initial discussion or write to address below. QUOTE REF. CW160-9H

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- Low interest loan facility
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- Active sports and social club

HARDWARE PRODUCT DEVELOPMENT

West Midlands

£8,000 + car

Our client seeks an experienced engineer, ideally with DEC or Data General experience, but other backgrounds will be actively considered, for an exciting career post.

You would produce, and support the marketing of commercial micro-systems which are a well-planned extension to our client's existing sizeable and successful minicomputer business.

You should offer a background in mini/micro computer technology, and be able to develop micro systems for general commercial use from components manufactured and supplied from a highly reputable and established source.

A knowledge of operating systems, diagnostic routines, and the ability to commission completed systems including software, would be ideal.

Any experience in liaison with manufacturers and customers would be very valuable.

This unique position offers the real opportunity to progress into a general managerial role as the company expands to provide commercial systems in this rapidly growing area of computing.

The company has extremely detailed and accurate plans for the future of this venture, and intends to involve the successful candidate fully in the setting up and future of the organisation.

General condition, such as pensions, free sickness benefit, six weeks holiday, hardware familiarity training, and company car are well above average.

A small number of more junior posts may be available for hardware engineers with a minimum of twelve months' experience. So if your interests lie in micro systems, please contact Mike Hession, reference CW 185 for a strictly confidential discussion.

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Systems Analyst

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Watford

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Cape Insulation Services Ltd., the largest domestic insulation contractors in the UK and part of the highly successful Cape Industries Group, currently require a Senior Systems Analyst.

Applicants (male/female) should have had several years' experience in all aspects of systems design and installation, preferably in a service or contracting business.

The successful candidate will be prepared to see through a complete development from the existing bureau operation to own machine in the shortest possible time.

The position offers a unique opportunity to develop the Data Processing function in a fast growing Company with consequent promotion opportunities.

Please write, or telephone, for an application form to:- Peter Reynolds, Personnel Manager, Cape Insulation Services Ltd., Rosanne House, Bridge Road, Welwyn Garden City, Herts. AL8 6UE. Tel: Welwyn Garden 31155.

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Services
Limited

LONDON BOROUGH OF BARKING

BOROUGH TREASURER'S DEPARTMENT

Computer Manager/ess

Grade P02(a)
£7,365-£8,109 inclusive
(pay award pending)

Applications are invited from suitably experienced persons able to communicate with and motivate staff. The Council has an IBM 370/125 with 4 disc drives and 2 tape drives, using RPG/II, and the ability to make full use of this installation and develop and implement new on-line systems and procedures is required.

Application forms from the Borough Treasurer, Civic Centre, Dagenham, Essex. Tel. 01-592 4500, Ext. 382.

Closing date: 8th August, 1979.

MERSEYSIDE COUNTY COUNCIL

SENIOR TECHNICIAN

(£4,773-£5,073 p.a. inc. supplement)

This post is in the Research and Forward Planning Section and is mainly with the computerisation of the Industrial Waste Management presentation of this information in the form of a computerised preparation of the Waste Disposal Plan.

The successful applicant, who will possess an appropriate degree in computer science, will be required to provide information and computing services. Experience in interview techniques and with public bodies would be an advantage.

Application forms, returnable by 17th August, 1979, may be obtained from the County Engineer, 4th Floor, 127, Conning Place, Liverpool L69 5EJ (Tel: 051 227 127).

(Please quote Ref. No. WDS13 in all correspondence)

NORTH WEST VACANCIES

PRESTON c. £7,000 + Bonus SYSTEMS ANALYSTS

Our client is seeking well educated Systems Analysts with over 2 years experience on financial or commercial applications. Candidates must be business problem solvers, and have seen projects through to completion.

NORTH MANCHESTER c. £5,900 SENIOR PROGRAMMER

Major UK Organisation requires a Senior Programmer with solid COBOL and super-visory experience to head large development team on major systems.

SALE c. £5,600 COBOL PROGRAMMERS

Our client requires COBOL Programmers with 2 or more years experience to work on a variety of applications. ICL experience preferred but not essential.

LIVERPOOL c. £6,250 SYSTEMS ANALYSTS

Large computer D.P. user is seeking 2 Systems Analysts who have seen systems through, and have a programming background preferably in COBOL.

OLDHAM c. £5,800 + Bonus SYSTEMS ANALYSTS

Systems Analysts with sound large systems experience are required to work on real-time commercial developments. Latest hardware and systems in operation.

OLDHAM c. £4,700 ANALYST/PROGRAMMERS

Our client is seeking young Analyst/Programmers who have gained at least 1 years COBOL experience and have had some analysis involvement. Interactive, Data-Base applications.

WARRINGTON c. £6,000 ANALYST/PROGRAMMER

Our client urgently requires a Systems Analyst with good COBOL, ideally on ICL hardware, with on-line application experience to lead small development team. Good benefits available.

NORTH MANCHESTER c. £7,000 SENIOR ANALYST

Large manufacturing company requires a Senior Analyst to head on-line development team of both Analysts and Programmers. Must have sound COBOL experience and in-depth analysis background.

PRESTON c. £5,000 + Bonus COBOL PROGRAMMERS

Young COBOL Programmers with around 2 years commercial/manufacturing background can gain the latest on-line applications experience with a major UK organisation. IBM experience an advantage but not essential. Very good benefits.

STOCKPORT c. £5,200 COBOL PROGRAMMERS

Our client requires COBOL Programmers with 1 to 2 years experience in a large installation. Outstanding career prospects.

MANCHESTER c. £6,000 SYSTEMS ANALYST

Systems Analyst with 2 years experience together with some programming knowledge is required by large IBM user. Background in CICS environment is an advantage.

MANCHESTER c. £4,500 COBOL PROGRAMMERS

To supplement development teams our client is seeking young COBOL Programmers with over 1 years experience. Large Data-Base on TP application development projects.

PRESTON c. £7,800 PROJECT LEADERS

Senior Analysts or existing Project Leaders are required by major company currently undertaking large systems development. Professional, mature staff can enjoy outstanding prospects.

Phone STEVE SYKES on LEEDS (0532) 444185 (day) reverse charges if necessary or on LEEDS 862417 (eve and weekends)

LORIEN COMPUTER SERVICES
OCS House,
Servia Road, Leeds LS7 1NJ
Telephone 0532 444185



MERSEYSIDE

Our client is seeking a number of DP professionals, at a variety of levels, to cover major developments utilising the latest IBM technology, including B100 SNA architecture systems.

SYSTEMS ANALYSTS TO £6,400 + BONUS

Analysts with sound commercial or manufacturing experience are required to work on large on-line systems. These include Materials and Production Control, Financial, Marketing and Works Operations applications.

ANALYST/PROGRAMMERS TO £6,400 + BONUS

Candidates should have gained good COBOL experience ideally, but not essentially, on large IBM hardware, together with some systems involvement. DL1, CICS and Distributed Processing experience can readily be gained.

PROGRAMMERS TO £5,650 + BONUS

Attractive vacancies exist for a number of ambitious programmers who should have a minimum of 18 months' experience which need not be on IBM hardware.

BENEFITS

In addition to a very attractive salary package, our client offers outstanding benefits including a subsidised canteen, concessionary rates on company goods, pension scheme, Flexitime and paid overtime.

CONTINUOUS TECHNICAL AND PERSONAL DEVELOPMENT TRAINING IS GIVEN AT ALL LEVELS.

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STEVE SYKES on LEEDS (0532) 444185 (daytime) or LEEDS (0532) 862417 (evenings and weekends), or write with career details to our Leeds office quoting reference 2CW. We are happy to talk to you at any time.

LORIEN COMPUTER SERVICES
OCS House,
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Telephone 0532 444185



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For further details, please telephone Reg Heath 021-843 2317 or evenings/weekends 021-351 4237
Expenses paid, interviews will be held in any of the above areas. Ref. RH/099/CW 26/7

OXFORD COBOL PROGRAMMER

An opportunity here for a person with two years experience to join a small friendly team.
Potential to move into systems analysis and experience of Honeywell equipment and software would be an advantage.
You will assist with systems design, program specification, systems testing and implementation, training will be given where necessary commencing salary circa £4500.

Write giving full details to:

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If you are thinking of doing contract work why not start here by registering now for immediate and forthcoming requirements.
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SYSTEMS ANALYST

£5922-£6537 (Review 1.7.79)

Applicants should have had at least two years' experience in all stages of systems analysis work and be familiar with ICL equipment. Public service experience would be useful but is not as important as broad experience of commercial applications.



SENIOR PROGRAMMER

£4968-£5763 (Review 1.7.79)

If you have had at least two years' experience of Cobol programming for Disc systems and George II experience then we can offer you the opportunity to lead a small team engaged on the development of a variety of financial and non-financial systems.

Further details and an application form are available from the Manpower Manager, Three Rivers District Council, 17/23 High Street, Rickmansworth, Herts WD3 1ET. (Tel: Rickmansworth 78611, Ext. 50)

PROGRAMMER

£3474-£4827 (Review 1.7.79)

With formal training in Cobol you could fill the above post. Ideally we would also like at least six months' experience and a knowledge of discs, paper tape and ICL equipment. However, we would also consider those who have recently completed an appropriate course.

The computer installation is a 32K 1901T with EDS 608 and the section is involved in important and varied financial and non-financial systems.

The benefits package include assistance with housing and a scheme of relocation allowances.

Test and Commissioning Engineers Test Engineers

GEC Computers Limited, the country's leading manufacturer of real-time computers, is expanding its recently opened manufacturing facilities at Dunstable, Bedfordshire.

Our success is largely due to the high quality of our products and our test and commissioning teams play a vital role in ensuring that standards are maintained. The work is technically challenging - the Company recently received the Queen's Award for technological achievement - and the men and women we are now looking for, will work on very advanced hardware and software using the latest automatic test equipment:

Test and Commissioning Engineers

to carry out fault diagnosis, repair, test, installation and commissioning work on processors, peripherals and microprocessor based controllers. Technical qualifications are desirable although not essential, but previous experience of similar work would be advantageous.

Test Engineers

to carry out test and quality control work at all stages from goods-inwards through to final acceptance testing.

Previous experience of similar work would be valuable.

Salaries are very competitive and other benefits include assistance with relocation where appropriate.

Telephone or write to Keith Halliday, GEC Computers Limited, Eynecourt Road, Dunstable, Bedfordshire. Telephone: Dunstable (0682) 608222 extension 24.



GEC Computers Limited



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All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring David Abbey for further details on 01-261 6016.

LONDON BOROUGH OF BROMLEY COMPUTER OPERATOR

(Ref. B.303)

C1.1 Salary up to
£3309-£3800
(Pay award pending)

Required to assist in operating the Council's ICL 1903T 128K computer. It operates under the George 3 operating system and supports batch processing together with a communications network of VDU and hard copy terminals. Experience of the operating system would be an advantage, although training could be provided.
A minimum age of 18 years applies and trainee operators will be considered.
Closing date: 8th August, 1979.

Application forms from the Assistant Chief Executive (Manpower), Town Hall, Bromley, Kent BR1 1SB. Telephone: 01-464 3333 Ext. 3318.

D.P.M.

W. LONDON C.S.K.
A management person for a small but forward looking IBM Systems 3. Manufacturing and Commercial Systems exp. Plus REG 11 knowledge.
ANAL/PROG - £7.5K for above installation
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DAVID WARD
107 Jermy Street, SW1

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Our Clients, based in Coventry, are a privately owned, highly successful, well respected supplier of turnkey mini computer systems with a substantial and impressive client base.

The Company market prestigious hardware products coupled with wide ranging application packages and provide excellent technical support which together should enhance your own personal success.

The candidate should be self-motivated, confident and have a proven sales record within the mini computer sales field and be between 25 and 35 years of age bringing to our Client a great deal of enthusiasm and commitment.

In return you will be given a substantial income package plus company car and a realistic and achievable sales target. If the opportunity of working with a young, professional management and sales team whose organisational structure can offer real career progression appeals to you then contact, for an immediate interview:

RICHARD CHAMPION ON: 021-236 3781 (24-hour answering service) OR: HAGLEY 884166 (evenings and weekends).

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★ Regular and prompt payment.

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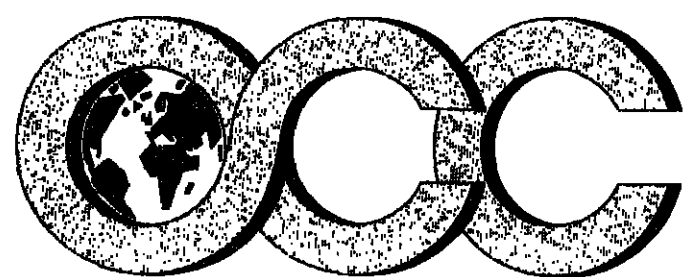
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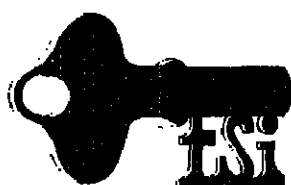
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Sales Representative

c £15,500 + car



TSI is the Software Product Division of National CSS, the largest IBM based time sharing organisation in the USA. The European subsidiary based in London has a vacancy for a Sales Representative.

TSI products are TASK/MASTER (the most widely installed TP Monitor for IBM 360/370 machines in the world), KEY/MASTER, CICS/MM for CICS users and DOCU/MASTER. Other TSI products are in preparation.

The new representative will take direct sales responsibility for all TSI products and services in the territory allocated as well as for existing accounts. It will be necessary to liaise with the Custom Support teams and to acquire a specialist knowledge of all TSI products and on-line system technology for IBM 370/360 computers.

The requirement is for either:

- A candidate with an IBM system software background with the essential personality, drive and initiative to move successfully into a sales environment.
- OR a Software Salesman with a good track record, preferably in the IBM market.

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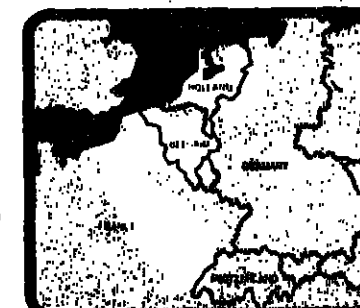
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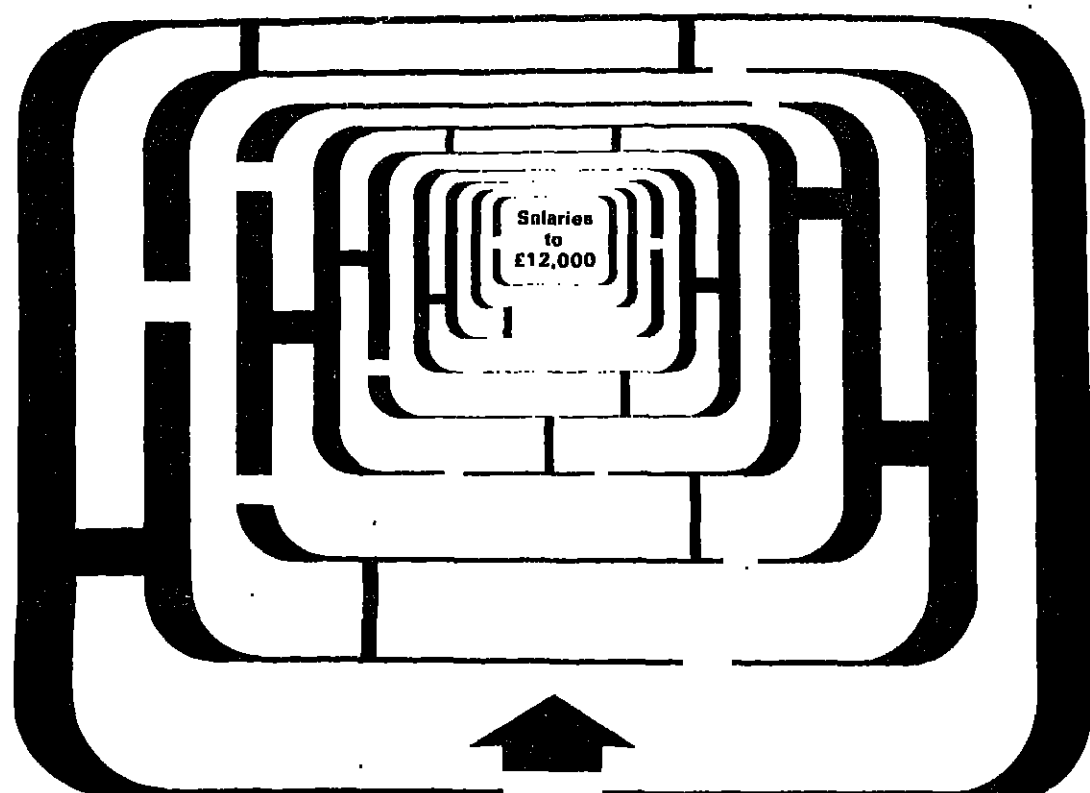
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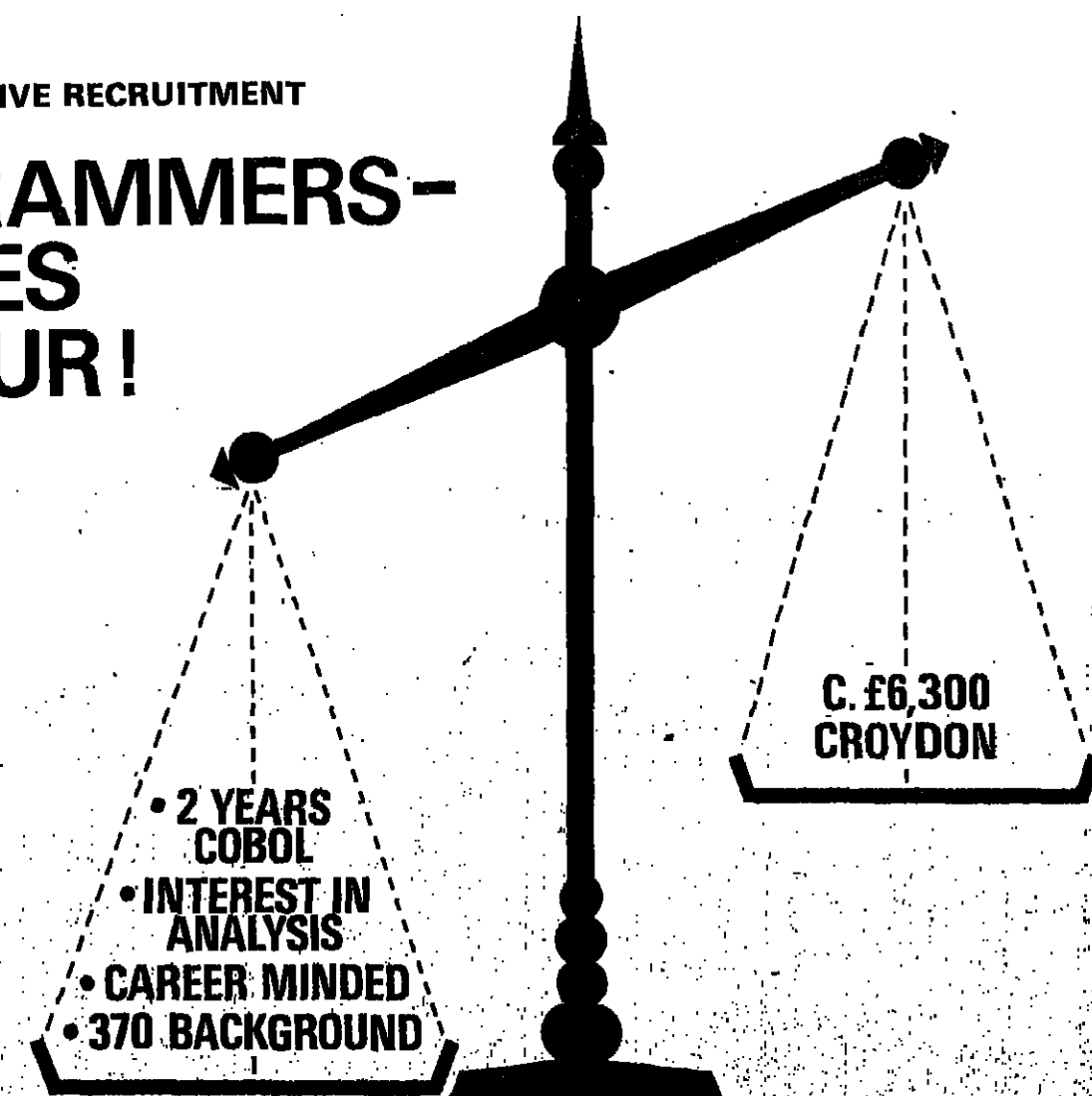
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or Telephone Caven Thomas, Group Computer Consultant
on 0802 46332 to discuss the opportunities available

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 - ii) The overall system architecture and operating system including the architecture of a single node.
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- Applications including curriculum vitae and the names and addresses of two referees, should be sent to Dr. M. Sleeman, Computing and Control Department, Imperial College, 180 Queen's Gate, London SW7 2BZ, by August 31, 1979. Additional information can be obtained from Dr. Sleeman or Mr. J. Kramer (01-688 8111, Ext 2735) or at the above address.

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PL/1

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HAWKER SIDDELEY

Brush Switchgear Limited Systems Analyst

Location: Loughborough, North Leicestershire.

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Because of the small size of the team, the work is varied and all aspects of systems development work are encountered. In addition, the use of Telecomputing's Interactive Development System provides the team with powerful on-line development facilities not normally associated with a machine of this size.

The position would therefore suit someone with one or two years computer experience, who would now benefit by joining a small team to broaden his or her experience.

An attractive salary with productivity bonus is offered together with generous company benefits, including the use of outside courses to ensure that the knowledge of the staff is continuously updated and expanded. Relocation expenses would be paid if appropriate.

Interested people are asked to ring either Mike Chislett or Derek Coombes on Loughborough 83131 Ext. 619 for further information or obtain an application form from:-

R. Newton, Personnel Officer Employment,
Brush Switchgear Limited, P.O. Box 19,
Meadow Lane, Loughborough,
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Telephone: Loughborough 83131 Ext. 489.

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Please write giving details to:
Yvonne Outan, Operations Supervisor
Computer Centre, University College London
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or telephone 01-387 0858.

NATURAL ENVIRONMENT

RESEARCH COUNCIL

NERC CENTRAL COMPUTING GROUP

ASSISTANT SCIENTIFIC OFFICER

The NERC Central Computing Group has a vacancy for an Assistant Scientific Officer to work at the Rutherford Laboratory, Chilton, near Didcot, Oxon. The post will involve providing general user support for the Univac computer. Specific responsibilities include support of existing major software systems, fault finding and job tracking when problems arise.

Minimum educational qualifications for appointment are 4 GCSE Level passes including English Language and a Scientific/Mathematical subject. Candidates should normally be under 26 years of age on 31st December 1979. Salary £2 074 p.a. at age 18 rising to £3 080 p.a. at age 21, £3 108 at age 22 rising to £3 818 p.a. at age 21. August 1979. These scales will be revised in January 1980.

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Application forms may be obtained from Mr. Young at NERC, Rutherford House, North Star Avenue, Buntingford (Tel. 0783-40101). Completed applications, forms should be returned by 10th August, 1979.

CITY OF LONDON

POLYTECHNIC

COMPUTER SERVICE

The Polytechnic's Computer Service Manager is looking for two more bright young people to join his 30 strong team based in The Minories EC3, close to Fenchurch Street station and within easy reach of Liverpool Street station.

COMPUTER OPERATOR

Ref 79/84

The successful candidate for the post will join a team operating at present on a two-shift basis. Preference will be given to applicants who have had operating experience on a large multi-access installation.

Salary: in the range £3048-£4717 (including London Weighting) plus a shift allowance of £284 p.a. Basic salary and London Weighting both currently under review. Starting point will depend on experience and qualifications.

COMPUTER ASSISTANT

Ref 79/85

The successful applicant for the post will perform various support duties to help ensure the smooth running of the Computer Service. A school-leaver with an aptitude for computer work will be considered.

Salary: in the range £2230-£3888 (including Weighting). Starting point depending on age, qualifications and experience. The basic salary and the London Weighting element are under review.

Good conditions for both posts include pension scheme, education and training facilities and annual leave which amounts to 4 weeks and 1 day, plus one additional day each calendar month.

For further details and an application form please apply to the Staff Records Officer, City of London Polytechnic, 117 Houndsditch, London EC3A 7BU, quoting the relevant reference number.

THE UNIVERSITY OF LANCASTER

Applications are invited for the post of

PROGRAMMER IN THE DEPARTMENT OF COMPUTER STUDIES.

Experience of the following would be an advantage: PASCAL, machine code programming and/or Data General NOVA software. Salary in the range £3775-£6365. Further particulars can be obtained quoting reference L154/C3 from the Establishment Officer, University House, Lancaster LA1 4YW, to whom applications (5 copies) naming three referees, should be sent not later than 27 August, 1979.

CONTRACTS

£300 PLUS

London and Home Counties

029 671 2049

24-hr. Answerphone

MANAGEMENT SERVICES DEPARTMENT

The City Council operates an ICL System 4/50 and a Univac 1108 with terminal network on a two-shift basis. We now require the following staff to work in the operations area:

Computer Operator

£2685-£8769 (under review) Grade AP4 (Ref: MS21)

The successful candidate will preferably be an experienced System 4 operator, but a Univac 1100 or IBM background would be considered. Minimum requirements are 5 'O' levels (including English and Maths) and 3 years' experience in computer operating.

Junior Computer Operator

£4407-£5002 (under review) Grade AP1 (Ref: MS22)

The successful candidate will preferably have at least 5 'O' levels (including Maths and English) or one year's experience of data processing. He/she will also be expected to have a basic understanding as to what areas a computer could be used for within a Local Authority.

Both these posts are in a career progression scheme where advancement is based on performance, experience and achievement. Training will be given where appropriate.

There are excellent benefits including:-

- up to 24 days' annual leave, PLUS an extra day off every four weeks
- interest-free annual season ticket loan
- subsidised canteen
- close to Victoria main line, tube and bus terminals

To obtain application form please send postcard, telephone or call at the Personnel Management Division (quoting appropriate reference number), PO Box 240, WESTMINSTER CITY COUNCIL, City Hall, Victoria Street SW1E 6QP, telephone number 01-834 6988 (24-hour answerphone service). Closing date 9th August, 1979.

Operations Specialists

for brand new data centre in Oxford Street

Colgate-Palmolive, the international consumer products company is a fast growing organisation with widely diversified interests and to maintain a high level of operational efficiency throughout our commercial and manufacturing activities we make extensive use of computers in virtually every department.

We're now setting up a data centre based on a brand new Honeywell DPS100 system with an extensive on-line communications network linking our headquarters with depots and manufacturing plants throughout the U.K.

The establishment of this data centre means that we now need to appoint additional experienced DP personnel to fill the following positions:-

Database Controller

To be responsible to the Operations Manager for formulating and maintaining the efficient structure and content of the database, co-ordinate systems/programming personnel and users with regard to future extensions and assist non-technical users by setting up enquiry facilities over on-line terminals.

The position will call for experience of database design, including a good knowledge of the Honeywell IDS language, familiarity with back-up and security systems for data files, and file management software and operating systems. Good communication skills are essential including an ability to instruct junior staff in data-base techniques.

Network Controller

To maintain in good working order the existing communications network and subsequent extensions in order to provide a continuous service. It will also involve dealing with faults and maintaining close liaison with equipment manufacturers, suppliers and the Post Office in regard to new extensions and fault tracing.

A good knowledge of modern communications equipment and techniques including terminals and modems and associated equipment developments is essential, coupled with an ability to trace faults and liaise with suppliers.

Junior Systems Analyst

To assist the Technical Service Supervisor in achieving optimum computer throughput including assisting in the maintenance and testing of operational systems; maintaining and testing new software modules; assisting programmers and engineers in tracing and curing faults. Other responsibilities will include operator and on-line user training and assisting school-leavers in the efficient use of job control language and file management.

It is an exciting new project and the career opportunities for both men and women with relevant skills and experience are, therefore, excellent. Salaries are highly competitive and the benefits attractive including generous discount on a wide range of Group products.

Write with full details of your experience, stating which position interests you, to Mark Parker, Personnel Officer Recruitment at Colgate-Palmolive Limited, 76 Oxford Street, London W1. Telephone: 01-580 2030.

Colgate-Palmolive



IBM OS COBOL LONDON ALL AREAS

c£240 + Exp.

If you are available now or in the next 6 weeks, contact

01-262 2251

PROJECT CO-ORDINATOR

AN EXCITING FUTURE IN THE DEVELOPMENT OF OFFICE COMMUNICATION SYSTEMS!

ITT is a market leader throughout Europe in the field of sophisticated office communication systems. I.D.E.C. was set up to specialise in providing the software expertise for the many different systems. This particular unit specialises in the development of highly sophisticated systems for translating customers requirements onto their hardware.

The job will involve liaising with systems houses and other I.D.E.C. units, upgrading of the Database used by the software production centre, and qualification of the first generation product support system for I.T.T.'s electronic P.A.B.X.

This appointment is based in modern offices in Fooks Cray which is on the borders of Kent and London, so offers the nearness of the capital together with the pleasures of the open countryside.

The person they are seeking will have a minimum of three years' experience of computer based projects, be a self starter and preferably have education to degree or H.N.C. level, although somebody with greater experience, without qualifications, would also be of interest.

The science of software production is still in its infancy which means that there are tremendous career opportunities in the field. I.T.T. has a record of past innovation and achievement, present investment in research and development will help fashion the shape of things to come.

This is what the future in communications will mean to you!

- ★ Starting salary to £7,500.
- ★ At least 23 days annual leave.
- ★ Discounts on many ITT products such as television sets, stereophonic and audio equipment.
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- ★ Modern offices near the countryside.

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A Development Centre for
ITT Business Systems

To find out more about this opportunity call BASIL PEARCE on 01-439 7871

Datascene Recruitment Ltd
Sceptre House
169-173 Regent Street
London W1R 7FB

datascene 01-439 7871
24hour answer phone

ICL COBOL PROGRAMMERS

City

to £7000

We have been retained by several companies operating a range of ICL installations covering all commercial applications who need programming staff at varying levels to continue their expansion programmes. The benefits offered vary, but many include the valuable SUBSIDISED MORTGAGE.

So if you have a minimum of 12 MONTHS' COBOL experience and are looking for a change, why not give us a call today.

Reference BP 30/1

IBM COBOL PROGRAMMERS

Middlesex

c£6000 + 5% Mortgage

A large insurance group operating an IBM 370 installation is seeking several programmers with a minimum of 18 MONTHS' COBOL who are looking for a more dynamic environment where they can utilise and expand on their experience.

The Company offers an extremely good starting salary, £1 a day L.V.'s, non-contributory pension, car park, sports club, plus of course the 5% MORTGAGE!!

Reference BP 30/2

SYSTEMS ANALYST

Middlesex

to c£7500

A large shipping and insurance group is seeking a Systems Analyst to join their small and friendly team, which operates an expanding ICL installation, with a new machine arriving shortly.

The person they are seeking should have approximately three years' analysis experience and possibly a programming background, although this is not essential.

The company offers excellent starting salaries together with extremely good fringe benefits including L.V.'s, season ticket loans, BUPA etc.

01-439 7871

Reference BP 30/3

FINANCIAL PROGRAMMER

Midlands

to £6500 + BONUS

A major manufacturer with installations all over the U.K. are currently seeking a programmer to work in their financial software development area. The ideal applicant will have had a minimum of 2 years' programming experience on financial application within a recognised financial institution such as a Bank or Insurance Company. This is an excellent opportunity for a programmer with either a Mainframe or Mini background to be involved with new developments on Mini's.

The company offer a very good starting salary coupled with various fringe benefits which include a bonus scheme.

Reference HK 30/4

BASIC + PROGRAMMERS

City

to c£7000 + Mortgage

An International Banking Group require all levels of BASIC + Programmers to be involved in their new MINI projects. A minimum of 3 years' experience in BASIC + is required or, alternatively, good experience in other languages would be considered for people who wish to enter the MINI field.

The Company have several DEC PDP 11 Machines coupled with large IBM Mainframes. Other attractions include flexi-time, Bonuses, subsidised Mortgages, and loans after 6 months.

Reference HK 30/5

MINI ASSEMBLER PROGRAMMERS

West London

to £7600

A small but rapidly expanding Software House based in London are currently seeking Assembler Programmers with a commercial background to work in Customer Support role.

If you have around 3 years' Assembler experience on either Mini's or Mainframes and would welcome involvement on a client contact basis then this opening would be of interest.

The Company offers good salary plus paid overtime and the chance to move into Analysis.

01-439 7871

Reference HK 30/6

Datascene Recruitment Ltd
Sceptre House
169-173 Regent Street
London W1R 7FB

datascene 01-439 7871
24hour answer phone

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First Class Opportunities for Experienced Computer Professionals in Nottingham

The Computing Division of the British Railways Board in Nottingham deals with a wide range of batch, on-line and real time projects. Computers used include an ICL 2980, ICL 2960, IBM 370/168, IBM 370/155, mini- and micro-computers.

The present requirement is for computing professionals with at least two years' experience of Cobol programming. There is also a requirement for more senior people especially with experience in IBM Assembler Systems programming or ICL 2900 range.

The commencing salaries will be within the following ranges:-

Programmer	— £5,230 to £5,819 (Ref. B241)
Senior Programmer and Systems Designer	— £5,869 to £6,596 (Ref. RB233).
Specialist and Project Leaders	— £6,518 to £7,450 (Ref. RB163/229)

There is a contributory pension scheme and the transfer of existing pension rights can, in most cases, be accepted. There are also free and reduced-rate rail travel facilities.

Applications stating age, education, qualifications and experience should be sent to:-

and exper: Headquarters Staff & Services Manager,
British Railways Board,
222 Marylebone Road,
London NW1 6JJ.
quoting the
above appropriate
reference number.

Computer Operator

A progressive career in Bracknell

We operate an H64/20 with communications under GCOS on a 2-shift system using disc, tape and the output from a Redlion Seecheck system.

We need an operator with at least a year's experience on the above installation to join our team providing a service to the Clark Eaton group - leading flat glass merchants, glazing contractors and glass processors. PM 200 knowledge would be a distinct advantage.

To find out more details on the job and salary offered, call Vincent Murphy, Personnel Manager on Bracknell (0344) 24733 or write to him at James Clark & Eaton Limited, PO Box 18, Southern Industrial Area, Bracknell, Berkshire RG12 4UL.

CLARK



FIELD SERVICE ENGINEERS

£6,000 + O.T. + QUALITY CAR

Fabulous opportunity to join a leading manufacturer of a wide range of prestige mini computers and peripherals. Excellent prospects include above average growth (43% increase in turnover plus two new branch offices plus 21 new product launches, all in the last year). Helpful friendly young management.

Basic salary £8,000 plus overtime plus car plus training. If you are ambitious, fast capable of assuming responsibility, why not take that all-important step forward - if living in London or Home Counties, call us today, but hurry.

Ref. EK2014.

AB EXECUTIVE (KINGSTON) LTD. 01-549 6442

MYRIAD

SYSTEMS ANALYSTS

SW LONDON

£8000-£9500

Having recently made a substantial investment in new hardware our client is now seeking two Systems Analysts to play a prominent part in the Company's new development program. These positions present an outstanding opportunity for experienced analysts to gain total systems experience with the prospect of progression to project management utilising advanced equipment and communications techniques.

One Analyst will initially have responsibility for developing a multi-Company Nominal Ledger system for subsidiary companies throughout the UK and overseas. The other Analyst will be involved with the feasibility of a new system to provide management with profitability and marketing statistics.

Applicants should be experienced analysts with knowledge of financial applications seeking greater challenge and a rewarding career in one of the foremost installations in the country. Used to working to high standards the successful candidates will enjoy functioning in user oriented situations and be capable of leading project teams. Conditions of employment are excellent and accompanied by a range of large company fringe benefits.

Ref. E1/2607

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants
Telephone or write to:- 30 Fleet Street London EC4Y 1AA 01-353 0981 (24 hrs)

Analyst/Programmer for a new Computer Team

Cheltenham Spa. around £6,000 plus relocation.

Endsleigh is the U.K. subsidiary of a prestigious insurance group based in the Netherlands. Formed in 1965, the company now holds a leading position in the student and academic market with over 50 insurance centres throughout the country.

We have recently installed an IBM System 34 computer, and we are now in the process of building up our computer team. It is a young, dynamic environment and we are already making plans to install an IBM System 38 in order to meet our ambitious computer development plan.

The successful applicant will play an important role in the development of our computer systems, and should have around five years experience in Data Processing with at least two of those spent in detailed analysis work.

The ideal candidate will have a sound commercial background preferably in the insurance industry, and should have experience of high level computer languages, particularly RPG II. Some experience of IBM GSD would also be extremely useful.

The company has an innovative approach to insurance, coupled with a highly progressive attitude to staff conditions. In addition to a negotiable salary, benefits include free pension, life assurance and permanent health insurance schemes and an attractive modern environment.

If you think you can make a contribution to a successful young company, then write to our assistant Personnel Manager, Alan Merry and tell him why.

Endsleigh

Endsleigh Insurance Services Ltd.
Endsleigh House, Cheltenham Spa.
Gloucestershire GL50 2BB.
Tel: Cheltenham (0242) 36161.

OEM SERVICE SUPPORT MANAGER

c. £7,500 + estate car + pension + P.P.P.

An established manufacturer of Magnetic media peripheral equipment is opening a direct U.K. and Scandinavian Marketing Office and requires a Service Manager.

This is an excellent ground floor opportunity for a person of proven service capability to mini computer peripherals. The ability to conduct training courses would be an advantage.

A good career progression and excellent total remuneration package will be offered to the right person.

Location will be Berkshire.

Please reply to Box 1041, Computer Weekly.

Rank Strand Electric require a Software Engineer

Rank Strand Electric through their U.K. base and associated overseas companies are the world leaders in theatre and TV lighting and control equipment. Mini-computers and micro-processors are already extensively used in the current product range, extending from simple 6800-based to multi-processor arrays hosted by a PDP 11/34.

To support this equipment and to develop new products, taking advantage of the next generation of micro-processors now becoming available, we need a Software Engineer to strengthen our team. The ideal person would have 2 or more years' experience in programming mini of micro-computers in assembly language for real-time applications, and experience in systems design and analysis. A good grasp of the technology and interfacing methods of micro-processor systems is required, as is the ability to liaise easily with electronics and system engineers ensuring rapid and successful development programmes.

A general education to degree standard, or less but with experience in this, is expected. This post is open to both men and women. Normal large company benefits apply, with subsidised canteen and social club.

For further details and an application form please write or telephone Mrs. Hutchings, Senior Personnel Officer, Rank Strand Electric, PO Box 70, Great West Road, Brentford, Middlesex. (Telephone 01-568 9228).

RANK STRAND ELECTRIC

ASSISTANT TO COMPUTER OPERATIONS SUPERVISOR

c. £5200

Due to expansion a position has arisen in the In-House Computer Department of our new H.Q. building administration offices for an experienced Computer Operator to assist the Computer Operations Supervisor.

The successful applicant, aged 22 or over, will have had one year's disk experience, preferably including NIXDORF equipment and will have a responsible outlook to his/her work.

Working in an installation including NIXDORF/DEC PDP11 and DATAPoint equipment, the main function will be to copy and process daily work schedule as supplied.

Basic hours of duty will be from 12 noon to 8.00 p.m. Monday to Friday, which will require an ability to work on own initiative.

As well as a good starting salary, we offer excellent working conditions: pension, life assurance, discount schemes, an excellent subsidised restaurant and a planned first-class social club.

For application form please apply Mrs. S. Parker, Staff Personnel Officer, Charrington and Company Limited, Anchor House, 110 East Road, London E1 4UL. Telephone: 01-790 1860.



Charrington

after your holiday.... ...why not a NEW CAR and a NEW CAREER

THE COMPANY are a household name and world leaders in their field. Their European headquarters are located in a brand new modern building situated in the western home counties and easily accessible both from London and more rural areas via the M3 and M4 motorways and convenient to a main line railway station. Our client's outstanding success is the combination of a highly professional, young management team coupled with an aggressive, innovative marketing image, backed by first class support from their computer systems area. A large IBM mainframe forms the base for the development of a number of on-line systems including a large overseas on-line network.

Due to increasing new development work the following three vacancies occur

SYSTEMS ANALYST to £7,400 + Car

At least two years of systems design and implementation, coupled with a flexible approach and the ability to "think on your feet" could gain you a key position in one of our clients project teams developing systems on a European basis.

QUALITY ASSURANCE ANALYST to £6,700 + Car

This new position within an independent standards and assurance function may suit Analysts or Programmers wishing to move into the expanding and challenging field of computer audit.

You will require 4 years + COBOL experience gained in an IBM OS environment coupled with the ability to contribute towards the development and subsequent auditing of standards and procedures in the field of program development.

LEAD PROGRAMMER to £6,700 + Car

This position will require 4 years plus COBOL experience gained in an IBM OS environment, coupled with the ability to lead a team of programmers and be involved with the initial design of systems. As our clients will offer you involvement with mini-computers, real-time experience would be a decided asset.

THE REWARDS are practically unbeatable and, in addition to a competitive salary and company car, will include free BUPA, non-contributory pension and superb working conditions.

So give yourself something to look forward to after your summer holiday and contact REX SCOONES at our Croydon office for full details on the company and the vacancies.

Positions open to male & female applicants, please telephone (24 hour service) for initial discussion or write to address below. QUOTE REF. CW161-9S

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Computer Servicing Saudi Arabia £16,350

If you have a C & G (or Service equivalent) plus five years' field or laboratory maintenance experience we can offer you an attractive two year contract including:

At least £16,350 tax free per contract.

Three paid leave periods annually with three free flights home to the UK.

Free bachelor accommodation, food and laundry.

Free medical care and life assurance.

Fill in the coupon with details of experience and send to the Senior Recruitment Executive (Lockheed), IAL, Personnel Consultancy, Aeradio House, Hayes Road, Southall, Middlesex. Telephone: 01-574 5000.

Name: _____

Address: _____

Tel: _____

Experience: _____



Ref: 3191

App 11/10/150

MANAGER COMPUTER INFORMATION

CITY OF LONDON up to £8000

We have been asked to recruit a well-educated person who has an orderly mind, has new ideas and enjoys taking the initiative as well as providing a really good service.

Our clients are an international manufacturing and marketing group whose management consultancy division maintains a Computer Information Centre to support its computer consultants and operating companies throughout the world.

Candidates should have:

- a good general knowledge of computers, hardware, software and their applications
- the ability to communicate well and write succinctly
- some previous business or analysis and programming experience

The company provides good terms of employment; a range of opportunities for career advancement and the chance to work in a friendly group of D.P. professionals in well-appointed offices.

For further details please ring us or write briefly quoting reference 773W. Messages will be recorded outside normal hours.

EDP SYSTEMS LTD
52-53 Margaret Street, London W1N 7FF
Telephone 01.637 5796 (24 hours)

UNIVERSITY OF
NEWCASTLE UPON TYNE
DEPARTMENT OF
ELECTRICAL AND
ELECTRONIC ENGINEERING

COMPUTER AIDED DESIGN OF V.L.S.I. SYSTEMS

Applications are invited from graduates with a good honours degree in Electronic Engineering or Computer Science to work on a project involving the evaluation and improvement of design aids for V.L.S.I. The department will have a colour graphics system exclusively for this project including a high resolution display and four colour plotter linked to the University's main frame computer.

The work itself will be carried out in collaboration with industry to develop aids to interactive layout, simulation and the management of the complex design problems associated with the next generation of integrated circuits.

Posts are available as follows:
1. Research Associate A (4,333-£7,521 p.a.) starting at a point not higher than £4,910 for a period of two and a half years from 1st October 1979, with membership of the appropriate University superannuation scheme.
2. S.R.C. CASE award Studentship in collaboration with the Plessey Company Limited. There will be opportunities for travel both in this country and abroad in connection with the project.

Further information is available from Professor D. J. Kinniment, Department of Electrical and Electronic Engineering, The University, Newcastle upon Tyne NE1 7RU, telephone 0632 28611 ext. 2338, with whom applications (3 copies) together with the names and addresses of 3 referees, should be lodged not later than 14th August, 1979. Please quote reference CW.



Western Australian Institute of Technology
School of Business & Administration

DEPARTMENT OF COMPUTING AND QUANTITATIVE STUDIES (Permanent Appointments)

Lecturer in SYSTEMS DESIGN
(Salary range £stg8,237 — £stg10,821)
(9th July Exchange Rate)

The lecturer in Systems Design is required to teach and develop subjects and courses in both batch and real-time systems design; the structured approach to analysis, design and programming; file structuring techniques including data base; data base design alternatives; system security; on-line data entry; information retrieval; and high level languages, in particular COBOL. (Ref. No. 225)

Lecturer in COMPUTERWARE
(Salary range £stg8,237 — £stg10,821)
(9th July Exchange Rate)

The lecturer in Computerware is required to teach and develop subjects and courses in computer hardware including large main frames, peripherals, minis, micros and world processing; computer software, including operating systems and utilities; programming languages including macro ASSEMBLER, FORTRAN and BASIC; contemporary developments in hardware and software and their particular application in business data processing. (Ref. No. 226)

Qualifications: Applicants for permanent lecturer positions should have a first degree as well as some relevant experience and an ability to communicate at the tertiary level. Evidence of capacity for self development is desirable.

Conditions include: Fees for appointee and family plus some assistance for removal expenses. Superannuation is available for staff with permanent tenure. The positions are permanent; however the Institute is interested in receiving applications from persons preferring a limited term (1-3 years) appointment. Return fares are provided for staff appointed for a limited term.

Applications: Details including the names, position titles, and addresses of three referees should be submitted not later than 24th August 1979 to the Migration Liaison Officer, Western Australia House, 115 Strand, London WC2 0AJ, England. A brochure containing further information may be obtained from the above address.

When applying please quote position reference number and the media code CW5

Computer Professionals

To meet an ever increasing workload our client, a large scale data processing installation based on the Eastern side of Birmingham, is looking for experienced operations staff. The system to be operated is VME/B on an ICL 2976 and a full range of peripherals is supported including offline OCR machine and graph plotter. There is also an extensive communications network serving RJE and MAC.

Senior Computer Operators
Earnings up to £3,750 (including shift allowance) Ref. AK1

Required to help the shift leader in the efficient running of the computer room and will have total control of the operations for significant periods. Applicants should have a minimum of three years experience of a large computer system including some at a senior level. A three shift rotating system covering the hours 24.00 Sunday to 19.00 Friday.

Candidates should have an appreciation of operational problems and/or an operational background and have experience in supporting remote users. They should also have the ability to work with minimal supervision and be able to liaise effectively with senior members of other sections of the Data Processing Department.

The Data Processing Installation is housed in a modern office block and all jobs offer opportunities for promotion and career development. The conditions of service are excellent and a substantial salary award is currently being negotiated. Please apply in writing to Position Number ABC004 Austin Knight Limited, Tricorn House, 31-33 Hagley Road, Edgbaston, Birmingham B16 8TP, quoting appropriate job reference number.

Applications are forwarded to the Client concerned, therefore Companies in which you are not interested should be listed in a covering letter to the Position Number Supervisor. Closing date: 7th August, 1979.

AK ADVERTISING

As a result of the acquisition of a new Honeywell Level 64 computer, Franklin Mint Ltd., the U.K. division of the world's largest private mint, are seeking to recruit a:

COMPUTER OPERATOR

£4,650 (including shift allowance)

We operate an attractive shift system which entails working only 3 shifts per week for two out of every three weeks.

Applicants should ideally have a minimum of 12 months' experience operating either a Honeywell Level 64 or Level 86 operating under GCOS. Alternatively we would accept experience of any medium/large IBM main frame system.

In addition to the salary, we operate a non-contributory pension scheme, free life and permanent health insurance, free BUPA and give L.V.s, a maximum of 20 days' holiday and a non-contractual bonus.

We will be commencing interviewing in the very near future, so if you are interested, please telephone Peter Brown now on 01-697 8121 or write to him at the address below.

Franklin Mint Ltd.
138 Bromley Road
London SE6 2XG

SERVICE ENGINEER COMPUTER PERIPHERALS — LONDON BASED

We need another field service engineer to look after our range of computer peripheral equipment. The person appointed will live within easy travelling range of central London, have some field service experience, possess a sound knowledge of electronics, preferably related to computer peripherals and processors, be prepared to work mainly in the central London area and occasionally throughout the U.K. A company car is provided. A full product training will be given on our range of vdu's, matrix and spark printers, mag-tape and floppy disc stores and drives.

Write or telephone for an interview to: Len Knott at the address below.

Penny & Giles Data Recorders Ltd
Mudford Churchchurch Dorset
Telephone: Highcliffe (042 52) 71511

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ENGINEERING
SCIENTIFIC BACKGROUND
CONTACT US, THE SPECIALISTS IN THESE
FIELDS

We urgently require Programmers with experience of Fortran, Assembler, Coral or Basic for Real-time Applications.

Jobs from £3,500 to £8,000 in all areas. Phone now for a free list of vacancies.

Capital Appointments, 20-30 Windmill Street, London W1
Telephone: 01-437 5581 (day) — 01-438 9836 (even)

THE UNIVERSITY
OF SHEFFIELD

Applicants are invited to send us their curriculum vitae for a post of:

PROGRAMMER/
SENIOR

PROGRAMMER

in the University Computing Service. The post will involve working on a variety of computer systems and will require a good knowledge of Fortran, Assembler, Coral or Basic for Real-time Applications. The post is full-time and involves a significant amount of travel. The salary is £4,000 per annum plus superannuation. The post is open until 31st August 1979. Applications should be sent to the Director of the Computing Service, University of Sheffield, Sheffield S10 2TN.

PROGRAMMER W. MIDLANDS

Business operations requires an additional programmer with:

- Two years' plus COBOL
- D.G. knowledge and basic business exp.

Salary £4,500 (+ car expenses)

Tel: Worcester 427077

Don Knaggs

OPPORTUNITIES IN SCOTLAND

D M L have been retained by various major installations in Scotland to relocate experienced computer staff throughout the U.K.

Current vacancies we are handling cover:

IBM ON-LINE SPECIALISTS (CICS/ASSEMBLER), SYSTEMS ANALYSTS, ANALYSTS/PROGRAMMERS, SUPPORT ANALYSTS (MINI COMPUTERS), SENIOR CONSULTANTS (SOFTWARE HOUSE), PROJECT LEADERS, SENIOR SYSTEMS ANALYSTS.

In all cases salaries are competitive and some vacancies offer fringe benefits e.g. mortgage subsidies, company car, etc.

If you are interested in moving to Scotland, then telephone Philip Bliss to discuss the possibilities on 031-226 8674 or write to: D M L Computer Personnel Service, 11 Charlotte Square, Edinburgh EH2 4DR.

LOCATION INTERVIEWS WILL BE CARRIED OUT IN MAJOR CENTRES THROUGHOUT THE U.K.

ata Computer Recruitment

A division of ATA Selection and Management Services, recruitment consultants to Industry and Commerce since 1962

Our client is a major International Group of Civil Engineering Consultants and Architects, based in West London. They offer an excellent fringe benefit package which includes:

- 1) Free Life Assurance
- 2) Free Medical Insurance
- 3) Non-contributory Pension Scheme
- 4) Luncheon Vouchers
- 5) Four Weeks' Holiday
- 6) Working hours based on Flexi-Time
- 7) Profit-related Bonus

PROGRAMMERS

£6,000

Using Fortran on Prime Mini Computers. The duties include liaison with computer users, maintenance of Software and the maximum utilization of the Hardware Systems. The successful applicant possessing a scientific degree or HND in computer studies and at least 2 years' computing experience.

ENGINEER/PROGRAMMERS

c £4,750 at 23

Holders of BSc and HND Civil Engineering with computer programming experience, are required to assist in the implementation of computer systems, advising Engineers on the selection and use of computer programs to solve engineering problems.

For further details telephone Lindsey Lee, 01-637 0781

ATA COMPUTER RECRUITMENT
230 Great Portland Street, London W1N 5HG

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